GE..GIA ENVIRONMENTAL PROTECTION D..ISION

LABORATORY REPORT

REF. 1

10828285

DATE: 12/11/85 PROJECT: FIRESTONE TIRE AND RUBBER CO. COLLECTOR: C. EVANS

	HW LOG NO.	1662	1663	1664		
DATE REC'D 12-12-85	LABEL	S-1 SOIL	S-2 SOIL	S-3 SOIL		
TIME REC'D 1200						
REC'D BY: H. LANFORD						
BY: C. EVANS						
Harold Lanford LABORATORY MANAGER						
DATE: 1-21-86						
PARAMETERS	LAB NO.	HW1662	HW1663	HW1664		
Trichloroethene	mg/kg	<1	<1	<1		
Benzene	"	<1	<1	<1		
1,1,1 Trichloroethane	"	<1	<1	<1		
Hexane	"	<1	<1	<1		
Methylene Chloride	"	<1	<1	<1		
Base Neutral Organic Compounds	mg/kg dry	<1	<1	<100		

RECEIVED JAN 23 19[illegible]

REMARKS: Sample # 1662 contained some oil approximately C[illegible]-C[illegible]

Sample # 1664 contained a large amount of oil approximately

REMEDIAL ACCESS UNIT

U.S. EPA REGION IV

SDMS

POOR LEGIBILITY

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V. 2-040506

.ORGIA ENVIRONMENTAL PROTECTION IVISION

LABORATORY REPORT

SAMPLE DATE: 12/11/85 PROJECT: FIRESTONE TIRE AND RUBBER CO. COLLECTOR: C. EVANS

DATE REC'D 12-12-85

TIME REC'D 1200

REC'D BY: H. LANFORD

DEL BY: C. EVANS

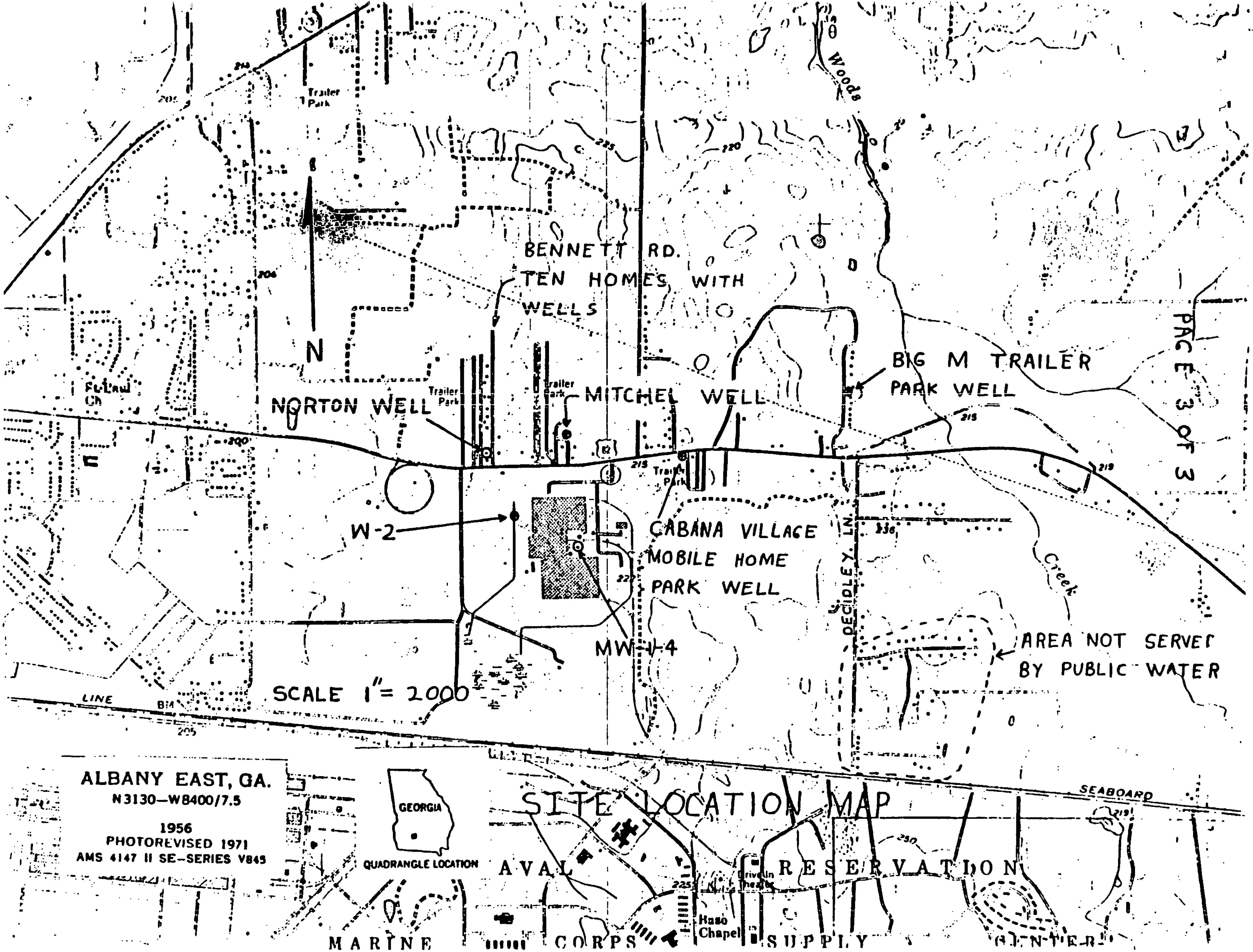
J Harold Lanford
LABORATORY MANAGER

DATE: 1-21-86

HW LOG NO.		1665	1666	1667		
LABEL		W-1 WATER	W-2 WATER	GW-1 WATER GROUND WATER FROM DEEP WELL ON SITE		
PARAMETERS	LAB NO.	HW 1665	HW1666	HW 1667		
Trichloroethene	ug/l	<1	2.6	<1		
Benzene	"	<1	1.8	<1		
1,1,1 Trichloroethane	"	<1	<1	<1		
Hexane	"	<1	<1	<1		
Methylene Chloride	"	<5	<5	<5		
Base Neutral Compounds	ug/l	<10	<10	<10		
pH		6.5	6.6	6.4		

RECEIVED JAN .. 1986 REMEDIAL ... UNIT

REMARKS:



SITE LOCATION MAP

REF. 2

RECORD OF TELEPHONIC CONVERSATION

Site Investigation Program

Routing: Reviewed by Mike Allred

Date: 8/26/86

Time: 2:28 ~~a.m.~~/p.m.

File: FIRESTONE TIRE + RUBBER CO.

Party Spoken To: DANNY Reed

Title: Chemist

Agency/Company: ENVIRONMENTAL PROTECTION DIVISION

Address: 47 TRINITY AVE.

City: ATLANTA

Telephone Number: (404) 656 - 4860

State/Zip: GA, 30334

Subject (file name): FIRESTONE TIRE AND RUBBER CO.

Summary of Call: I questioned MR. Reed about the validity of the laboratory data on sample W-2 from the Firestone Tire and Rubber Company samples collected on 12/11/85. In MR. Reed's opinion the results were valid numbers and not anomalous readings.

Actions Required: None

Signature: Charles P. Evans 8/26/86

Follow-up Responses/Additional Comments:

Signature:

Date:

32111 Aurora Road
Solon Ohio 44139
216-349 2708

RECEIVED

Woodward-Clyde Consultants

MAY 26 1987

85C7103-10

SITE INVESTIGATION PROGRAM

19 May 1987

The Firestone Tire & Rubber Co.
1200 Firestone Parkway
Akron, Ohio 44317

Attention: Mr. D. Bennett

**ENVIRONMENTAL SITE ASSESSMENT OF
THE FIRESTONE TIRE & RUBBER COMPANY FACILITY
AT ALBANY, GEORGIA**

Gentlemen:

Woodward-Clyde Consultants (WCC) is pleased to present herein the final report on the results of the environmental site assessment of Firestone's former tire manufacturing facility in Albany, Georgia. The report consists of three (3) volumes: main report, figures and tables, and appendices. The report incorporates responses to your previous questions and comments.

It has been a pleasure working with you on this project. Should you have any additional questions, please do not hesitate to contact us.

Very truly yours,

WOODWARD-CLYDE CONSULTANTS

Vydas M. Brizgys

Vydas M. Brizgys
Project Geologist

VMB:jc

D419/173

ENVIRONMENTAL SITE ASSESSMENT OF FIRESTONE TIRE AND RUBBER FACILITY AT ALBANY, GEORGIA

Prepared For:

The Firestone Tire and Rubber Company
1200 Firestone Parkway
Akron, Ohio 44317

Prepared By:
Woodward-Clyde Consultants
32111 Aurora Road
Solon, Ohio 44139

Vydas M. Brizgys
Vydas M. Brizgys
Project Geologist

Robert S. Junkrowski
Robert S. Junkrowski, P.E.
Sr. Project Engineer

GEORGIA
REGISTERED
No. 16203
PROFESSIONAL
ENGINEER

sufficient in 1978 to raise the water level to about 110 feet below ground surface in a well near the center of municipal pumpage. The Providence aquifer is recharged in a manner similar to the Clayton aquifer, along a northeast-trending line about 50 miles north-northwest of Albany.

Typically, wells developed individually in the Providence, Clayton and Tallahatta aquifers in the Albany area yield insufficient quantities of water to be cost-effective. For this reason, the City of Albany uses multi-aquifer wells that tap two or more of the aquifers simultaneously. If properly constructed, these wells can reportedly produce a sustained yield of as much as 1500 gpm while generating a smaller drawdown than a single-aquifer well.

Although rainfall is the primary source of recharge for all four major aquifers, another source of recharge may exist. Increased vertical flow through the confining beds separating one aquifer from another may occur when heavy pumping reduces the hydrostatic pressure in a given aquifer to a value below that of an adjacent aquifer. Near the city of Albany, heavy pumping from the Providence, Clayton and Tallahatta aquifers reportedly has produced head differences that could enhance leakage. Preliminary water quality analyses have indicated that water may be leaking from the Providence aquifer up into the Clayton.

3.0 SITE RECONNAISSANCE

To review the proposed assessment program, a site reconnaissance was performed by WCC, Firestone-Corporate and Firestone-Albany personnel on 5 and 6 December 1985. The proposed scope of work was modified on the basis of site-specific conditions, and the number of borings and monitoring well installations were defined, as discussed below. The locations of the areas investigated are shown on Figure 6.

<u>Area 1 - Gasoline Storage Tanks:</u> Two exploratory borings through tank backfill and one groundwater monitoring well installation were scheduled for this area.

Area 2 - Power House and Maintenance: Four shallow soil borings were scheduled for the area adjacent to the drummed oil storage area.

Area 3 - General Maintenance & Stores: Three shallow soil borings were scheduled adjacent to the building expansion that was constructed over an area that may have been used for equipment cleaning.

Area 4 - Primary Plant Transformers: Eight surficial soil grab samples around the four PCB transformers were scheduled to evaluate the potential presence of PCB's in the soil.

Area 5 - Solvent Unloading Station: Three shallow soil borings were scheduled for unpaved areas adjacent to the solvent unloading station to evaluate the potential presence of solvents in the soil.

Area 6 - Process Oil Unloading Station: One shallow soil boring was scheduled to evaluate the potential presence of contaminants of concern in the soil.

Area 7 - Process Oil and Solvent Storage Tanks: Three shallow soil borings, two exploratory borings and three monitoring well installations were scheduled. The three shallow soil borings were scheduled for an unpaved area adjacent to a drummed hazardous waste transfer area. To evaluate potential tank leakage, two exploratory borings were scheduled for the tank backfill, and one of the monitoring wells was scheduled for installation within the tank backfill adjacent to the underground solvent storage tanks. The other two monitoring wells were scheduled for installation adjacent to the tank area.

Area 8 - Trash Compactor: This area was added due to visually-apparent discoloration of soil adjacent to the trash compactor. Two shallow soil borings were scheduled.

Area 9 - Hazardous Waste Storage Area: Two monitoring wells and six shallow soil borings were proposed. The shallow soil borings were delayed until after State approval of the closure plan and implementation of closure. The two monitoring wells were scheduled.

Area 10 - Fire Training Area: This area was added due to visually-apparent discoloration of soil and because spent solvents may have been used as fuels. Three shallow soil borings were scheduled.

Area 11 - East Fuel Oil Tanks: Three shallow soil borings were scheduled for an area adjacent to the above-ground fuel oil tanks that may have been used for drummed waste storage.

Area 12 - Spill Containment/Burn Area: A pit was excavated in this area in the past to prevent a spill of anti-oxidant from entering the pond. The waste was subsequently burned under the supervision of the local fire department. Three exploratory borings and one monitoring well installation were scheduled.

Area 13 - West Drainage Ditch: The west drainage ditch receives runoff from the plant roof where PCB equipment was mounted. Six sediment samples and one surface water sample were scheduled.

Area 14 - Pond: Two sediment samples were scheduled for the pond, which receives runoff from the plant site.

Area 15 - Ditch Scrapings: Two composite grab samples were scheduled for the area where scrapings from surface drainage ditches were placed.

Three monitoring wells were also scheduled for placement around the plant site to provide information on background water quality.

4.0 INITIAL FIELD INVESTIGATIONS

Initial field investigations at the Albany facility consisted of drilling of borings, soil and sediment sampling, groundwater monitoring well installation, groundwater elevation measurements, and groundwater and surface water sampling. These tasks are described below.

Appendices

Environmental Site Assessment of Firestone Tire and Rubber Company Facility at Albany, Georgia

Prepared for:

The Firestone Tire and Rubber Company
1200 Firestone Parkway
Akron, Ohio 44317

Woodward-Clyde Consultants

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

Appendix B

Woodward Clyde Consultants
Project No. 857103
Firestone Tire & Rubber

Prepared For:

Woodward Clyde Consultants
32111 Aurora Road
Solon, OH 44139

Prepared By:

Robert S. Glowacky
Robert S. Glowacky
Melmore Laboratory Manager

Jeffrey A. Smith
Jeffrey A. Smith
Marion Laboratory Manager

LIST OF TABLES

Table I.
Woodward Clyde Consultants - Project No. 85C7103
Firestone Tire & Rubber
Date Sampled 2/18/86 and 2/19/86
Inventory of Samples

ATEC - Marion Lab No.	ATEC - Melmore Lab No.	Woodward Clyde Consultants No.	Sample Type
785-86	10301	MW-1-1	water
786-86	10302	MW-7-3	water
787-86	10303	MW-7-4	water
788-86	10304	BMW-2	water
781-86	10305	MW-12-1	water
782-86	10306	BMW-3	water
783-86	10307	ALB-PW-1	water
784-86	10308	ALB-OW-1	water
789-86	10309	ALB-PW-3	water
790-86	10310	ALB-PW-2	water
795-86	10311	ALB-TB-1	water
791-86	10312	ALB-OW-2	water
----	10313	G-4-5-1	sediment
----	10314	G-4-5-2	sediment
----	10315	G-4-6-1	sediment
----	10316	G-4-6-2	sediment
----	10317	G-4-7-1	sediment
----	10318	G-4-7-2	sediment
----	10319	G-4-8-1	sediment
----	10320	G-4-8-2	sediment
792-86	10321	SURWAT-10-1U	water
793-86	10322	SURWAT-10-1D	water
794-86	10323	SURWAT-10-2D	water
797-86	10324	SURWAT-13-1D	water
----	10325	SED-13-1B	sediment
----	10326	SED-13-1S	sediment
----	10327	SED-13-2B	sediment
----	10328	SED-13-2S	sediment
----	10329	SED-13-3B	sediment
----	10330	SED-13-3S	sediment
----	10331	ALB-PND-1I	sediment
----	10332	ALB-PND-2D	sediment

Table II.
Woodward Clyde Consultants - Project No. 85C7103
Firestone Tire & Rubber
Date Sampled 2/18/86
Priority Pollutant Volatile Fraction

ATEC Sample No. Client Sample No.	10301 MW-1-1-1	10302 MW-7-3-1	10303 MW-7-4-1
Acrolein	< 100	< 100	< 100
Acrylonitrile	< 100	< 100	< 100
Benzene	199	< 1.0	< 1.0
Bromoform	< 1.0	< 1.0	< 1.0
Carbon Tetrachloride	< 0.5	< 0.5	< 0.5
Chlorobenzene	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	< 0.5	< 0.5	< 0.5
Chloroethane	< 1.0	< 1.0	< 1.0
2-Chloroethyl Vinyl Ether	< 1.0	< 1.0	< 1.0
Chloroform	< 0.5	< 0.5	< 0.5
Dichlorobromomethane	< 0.5	< 0.5	< 0.5
Dichlorodifluoromethane	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	< 0.5	< 0.5	658
1,2-Dichloroethane	< 0.5	< 0.5	< 0.5
1,1-Dichloroethene	32.2	< 0.5	348
1,2-Dichloropropane	< 1.0	< 1.0	< 1.0
cis-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0
Ethyl Benzene	327	< 1.0	< 1.0
Methyl Bromide	< 1.0	< 1.0	< 1.0
Methyl Chloride	< 1.0	< 1.0	< 1.0
Methylene Chloride	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0
Tetrachloroethene	< 0.5	< 0.5	< 0.5
Toluene	135	< 1.0	10.5
trans-1,2-Dichloroethene	< 0.5	< 0.5	< 0.5
1,1,1-Trichloroethane	41.9	< 0.5	19.8
1,1,2-Trichloroethane	< 0.5	< 0.5	< 0.5
Trichloroethene	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	< 1.0	< 1.0	< 1.0
Vinyl Chloride	< 1.0	< 1.0	< 1.0

All concentrations expressed as ug/l.

Table II. (Cont'd.)
Woodward Clyde Consultants - Project No. 85C7103
Firestone Tire & Rubber
Date Sampled 2/18/86
Priority Pollutant Volatile Fraction

ATEC Sample No. Client Sample No.	10304 BMW-2-1	10305 MW-12-1-1	10306 BMW-3-1
Acrolein	< 100	< 100	< 100
Acrylonitrile	< 100	< 100	< 100
Benzene	< 1.0	< 1.0	< 1.0
Bromoform	< 1.0	< 1.0	< 1.0
Carbon Tetrachloride	< 0.5	< 0.5	< 0.5
Chlorobenzene	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	< 0.5	< 0.5	< 0.5
Chloroethane	< 1.0	< 1.0	< 1.0
2-Chloroethyl Vinyl Ether	< 1.0	< 1.0	< 1.0
Chloroform	< 0.5	< 0.5	< 0.5
Dichlorobromomethane	< 0.5	< 0.5	< 0.5
Dichlorodifluoromethane	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	< 0.5	7.3	17.8
1,2-Dichloroethane	< 0.5	< 0.5	< 0.5
1,1-Dichloroethene	< 0.5	1.6	1.5
1,2-Dichloropropane	< 1.0	< 1.0	< 1.0
cis-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0
Ethyl Benzene	< 1.0	< 1.0	< 1.0
Methyl Bromide	< 1.0	< 1.0	< 1.0
Methyl Chloride	< 1.0	< 1.0	< 1.0
Methylene Chloride	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0
Tetrachloroethene	< 0.5	< 0.5	< 0.5
Toluene	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroetheme	< 0.5	< 0.5	< 0.5
1,1,1-Trichloroethane	< 0.5	11.7	1.1
1,1,2-Trichloroethane	< 0.5	< 0.5	< 0.5
Trichloroethene	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	< 1.0	< 1.0	< 1.0
Vinyl Chloride	< 1.0	< 1.0	< 1.0

All concentrations expressed as ug/l.

Table II. (Cont'd.)
Woodward Clyde Consultants - Project No. 85C7103
Firestone Tire & Rubber
Date Sampled 2/18/86
Priority Pollutant Volatile Fraction

ATEC Sample No.	10307	10308	DUPLICATE PW-1 VMB 10309
Client Sample No.	ALB-PW-1-1	ALB-OW-1-1	ALB-PW-3-1
Acrolein	< 100	< 100	< 100
Acrylonitrile	< 100	< 100	< 100
Benzene	< 1.0	< 1.0	< 1.0
Bromoform	< 1.0	< 1.0	< 1.0
Carbon Tetrachloride	< 0.5	< 0.5	< 0.5
Chlorobenzene	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	< 0.5	< 0.5	< 0.5
Chloroethane	< 1.0	< 1.0	< 1.0
2-Chloroethyl Vinyl Ether	< 1.0	< 1.0	< 1.0
Chloroform	< 0.5	< 0.5	< 0.5
Dichlorobromomethane	< 0.5	< 0.5	< 0.5
Dichlorodifluoromethane	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	< 0.5	< 0.5	< 0.5
1,2-Dichloroethane	< 0.5	< 0.5	< 0.5
1,1-Dichloroethene	< 0.5	< 0.5	< 0.5
1,2-Dichloropropane	< 1.0	< 1.0	< 1.0
cis-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0
Ethyl Benzene	< 1.0	< 1.0	< 1.0
Methyl Bromide	< 1.0	< 1.0	< 1.0
Methyl Chloride	< 1.0	< 1.0	< 1.0
Methylene Chloride	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0
Tetrachloroethene	< 0.5	< 0.5	< 0.5
Toluene	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	< 0.5	< 0.5	< 0.5
1,1,1-Trichloroethane	< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethane	< 0.5	< 0.5	< 0.5
Trichloroethene	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	< 1.0	< 1.0	< 1.0
Vinyl Chloride	< 1.0	< 1.0	< 1.0

All concentrations expressed as µg/l.

Table II. (Cont'd.)
Woodward Clyde Consultants - Project No. 85C7103
Firestone Tire & Rubber
Date Sampled 2/18/86
Priority Pollutant Volatile Fraction

		TRIP BLANK	FIELD BLANK
ATEC Sample No.	10310	10311	10312
Client Sample No.	ALB-PW-2-1	ALB-TB-1-1	ALB-OW-2-1
Acrolein	< 100	< 100	< 100
Acrylonitrile	< 100	< 100	< 100
Benzene	< 1.0	< 1.0	< 1.0
Bromoform	< 1.0	< 1.0	< 1.0
Carbon Tetrachloride	< 0.5	< 0.5	< 0.5
Chlorobenzene	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	< 0.5	< 0.5	< 0.5
Chloroethane	< 1.0	< 1.0	< 1.0
2-Chloroethyl Vinyl Ether	< 1.0	< 1.0	< 1.0
Chloroform	< 0.5	< 0.5	< 0.5
Dichlorobromomethane	< 0.5	< 0.5	< 0.5
Dichlorodifluoromethane	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	< 0.5	< 0.5	< 0.5
1,2-Dichloroethane	< 0.5	< 0.5	< 0.5
1,1-Dichloroethene	< 0.5	< 0.5	< 0.5
1,2-Dichloropropane	< 1.0	< 1.0	< 1.0
cis-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0
Ethyl Benzene	< 1.0	< 1.0	< 1.0
Methyl Bromide	< 1.0	< 1.0	< 1.0
Methyl Chloride	< 1.0	< 1.0	< 1.0
Methylene Chloride	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0
Tetrachloroethene	< 0.5	< 0.5	< 0.5
Toluene	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	< 0.5	< 0.5	< 0.5
1,1,1-Trichloroethane	< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethane	< 0.5	< 0.5	< 0.5
Trichloroethene	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	< 1.0	< 1.0	< 1.0
Vinyl Chloride	< 1.0	< 1.0	< 1.0

All concentrations expressed as ug/l.

Table V.
Woodward Clyde Consultants - Project No. 85C7103
Firestone Tire & Rubber
Date Sampled 2/19/86
PCB Fraction

ATEC Sample No.	10313	10314	10315
Client Sample No.	G-4-5-1	G-4-5-2	G-4-6-1
PCB-1016	<2.0	<1.0	<5.0
PCB-1221	<2.0	<1.0	<5.0
PCB-1232	<2.0	<1.0	<5.0
PCB-1242	<2.0	<1.0	<5.0
PCB-1248	<2.0	<1.0	<5.0
PCB-1254	17.9	3.5	330
PCB-1260	<2.0	<1.0	<5.0

All concentrations expressed as mg/kg.

ATEC Sample No.	10316	10317	10318
Client Sample No.	G-4-6-2	G-4-7-1	G-4-7-2
PCB-1016	<10.0	<5.0	<5.0
PCB-1221	<10.0	<5.0	<5.0
PCB-1232	<10.0	<5.0	<5.0
PCB-1242	<10.0	<5.0	<5.0
PCB-1248	<10.0	<5.0	<5.0
PCB-1254	1370	71	47
PCB-1260	<10.0	<5.0	<5.0

All concentrations expressed as mg/kg.

Table V. (Cont'd.)
Woodward Clyde Consultants - Project No. 85C7103
Firestone Tire & Rubber
Date Sampled 2/19/86
PCB Fraction

ATEC Sample No.	10319	10320	10325
Client Sample No.	G-4-8-1	G-4-8-2	SED-~~18~~-1B 13
PCB-1016	<1.0	<1.0	<1.0
PCB-1221	<1.0	<1.0	<1.0
PCB-1232	<1.0	<1.0	<1.0
PCB-1242	<1.0	<1.0	<1.0
PCB-1248	<1.0	<1.0	<1.0
PCB-1254	<1.0	1.3	<1.0
PCB-1260	<1.0	<1.0	1.4

All concentrations expressed as mg/kg.

ATEC Sample No.	10326	10327	10328
Client Sample No.	SED-13-1S	SED-13-2B	SED-13-2S
PCB-1216	<1.0	<1.0	<1.0
PCB-1221	<1.0	<1.0	<1.0
PCB-1232	<1.0	<1.0	<1.0
PCB-1242	<1.0	<1.0	<1.0
PCB-1248	<1.0	<1.0	<1.0
PCB-1254	<1.0	<1.0	<1.0
PCB-1260	<1.0	<1.0	<1.0

All concentrations expressed as mg/kg.

Table X. (Cont'd.)
Woodward Clyde Consultants - Project No. 85C7103
Firestone Tire & Rubber
Date Sampled 2/18/86
Priority Pollutant Volatile Fraction - Spike Data

ATEC Sample No.	Spike	10310 Spiked Sample	% Recovery
Acrolein	----	----	----
Acrylonitrile	----	----	----
Benzene	----	----	----
Bromoform	----	----	----
Carbon Tetrachloride	----	----	----
Chlorobenzene	----	----	----
Chlorodibromomethane	----	----	----
Chloroethane	----	----	----
2-Chloroethyl Vinyl Ether	----	----	----
Chloroform	42.0	38.1	91
Dichlorobromomethane	----	----	----
Dichlorodifluoromethane	----	----	----
1,1-Dichloroethane	----	----	----
1,2-Dichloroethane	48.3	23.1	48
1,1-Dichloroethene	----	----	----
1,2-Dichloropropane	----	----	----
cis-1,3-Dichloropropene	----	----	----
trans-1,3-Dichloropropene	----	----	----
Ethyl Benzene	----	----	----
Methyl Bromide	----	----	----
Methyl Chloride	----	----	----
Methylene Chloride	----	----	----
1,1,2,2-Tetrachloroethane	48.7	68.5	141
Tetrachloroethene	14.2	8.7	61
Toluene	12.9	15.0	116
trans-1,2-Dichloroethene	----	----	----
1,1,1-Trichloroethane	----	----	----
1,1,2-Trichloroethane	----	----	----
Trichloroethene	19.9	17.2	86
Trichlorofluoromethane	----	----	----
Vinyl Chloride	----	----	----

All concentrations expressed as ug/l.

Table X. (Cont'd.)
Woodward Clyde Consultants - Project No. 85C7013
Firestone Tire & Rubber
Priority Pollutant Base-Neutral Fraction - Spike Data

ATEC Sample No.	10304		%
	Spike	Spiked Sample	Recovery
Acenaphthene	19.7	16.5	84
Acenaphthylene	----	----	----
Anthracene	20.0	17.9	90
Benzidine	----	----	----
Benzo(a)anthracene	----	----	----
Benzo(a)pyrene	22.4	16.8	75
3,4-Benzofluoranthene	20.3	15.4	76
Benzo(ghi)perylene	30.0	21.4	73
Benzo(k)fluoranthene	----	----	----
Bis(2-chloroethoxy)methane	----	----	----
Bis(2-chloroethyl)ether	----	----	----
Bis(2-chloroisopropyl)ether	20.4	18.1	89
Bis(2-ethylhexyl)phthalate	15.3	12.5	82
4-Bromophenyl Phenyl Ether	37.3	34.1	91
Butyl Benzyl Phthalate	25.0	22.7	89
2-Chloronaphthalene	----	----	----
4-Chlorophenyl Phenyl Ether	37.4	35.5	95
Chrysene	20.9	19.8	95
Dibenzo(a,h)anthracene	----	----	----
1,2-Dichlorobenzene	----	----	----
1,3-Dichlorobenzene	----	----	----
1,4-Dichlorobenzene	25.1	23.9	95
3,3'-Dichlorobenzidine	----	----	----
Diethyl Phthalate	----	----	----
Dimethyl Phthalate	10.4	10.2	98
Di-n-butylphthalate	----	----	----
2,4-Dinitrotoluene	----	----	----
2,6-Dinitrotoluene	----	----	----
Di-n-Octyl Phthalate	----	----	----
1,2-Diphenylhydrazine	----	----	----
Fluoranthene	30.1	27.4	91
Fluorene	25.0	21.4	86
Hexachlorobenzene	----	----	----
Hexachlorobutadiene	----	----	----
Hexachlorocyclopentadiene	----	----	----
Hexachloroethane	30.3	28.2	93
Indeno(1,2,3-cd)pyrene	----	----	----
Isophorone	----	----	----
Naphthalene	25.0	22.3	89
Nitrobenzene	37.3	31.3	84
N-Nitrosodimethylamine	----	----	----
N-Nitroso-n-propylamine	----	----	----
N-Nitrosodiphenylamine	----	----	----
Phenanthrene	----	----	----
Pyrene	----	----	----
1,2,4-Trichlorobenzene	----	----	----

All concentrations expressed as ug/l.

Table X. (Cont'd.)
Woodward Clyde Consultants - Project No. 85C7103
Firestone Tire & Rubber
Date Sampled 2/18/86
Priority Pollutant Organochlorine and PCB Fraction - Spike Data

ATEC Sample No.	Spike	10304 Spiked Sample	% Recovery
Aldrin	----	----	----
α-BHC	2.0	1.9	95
β-BHC	----	----	----
γ-BHC	1.0	0.9	90
δ-BHC	----	----	----
Chlordane	----	----	----
4,4'-DDD	3.5	3.4	97
4,4'-DDE	----	----	----
4,4'-DDT	----	----	----
Dieldrin	2.0	2.1	105
Endosulfan I	----	----	----
Endosulfan II	----	----	----
Endosulfan Sulfate	----	----	----
Endrin	2.0	2.5	125
Endrin Aldehyde	----	----	----
Heptachlor	2.5	2.6	104
Heptachlor Epoxide	3.0	2.8	93
Toxaphene	----	----	----
PCB-1016	----	----	----
PCB-1221	----	----	----
PCB-1232	----	----	----
PCB-1242	----	----	----
PCB-1248	----	----	----
PCB-1254	----	----	----
PCB-1260	----	----	----

All concentrations expressed as ug/l.

Table X. (Cont'd.)
Woodward Clyde Consultants - Project No. 85C7103
Firestone Tire & Rubber
Date Sampled 2/19/86
PCB Fraction - Spike Data

ATEC Sample No.	Spike	10313 Spiked Sample	% Recovery
PCB-1016	----	----	----
PCB-1221	----	----	----
PCB-1232	----	----	----
PCB-1242	----	----	----
PCB-1248	----	----	----
PCB-1254	24.6	21.2	87
PCB-1260	----	----	----

All concentrations expressed as mg/kg.

ATEC Sample No.	Spike	10326 Spiked Sample	% Recovery
PCB-1016	----	----	----
PCB-1221	----	----	----
PCB-1232	----	----	----
PCB-1242	2.3	2.4	104
PCB-1248	----	----	----
PCB-1254	----	----	----
PCB-1260	----	----	----

All concentrations expressed as mg/kg.

Table X. (Cont'd.)
Woodward-Clyde Consultants - Project No. 85C7103
Firestone Tire & Rubber
Date Sampled 2/18/86
Priority Pollutant Acid Fraction - Spike Data

ATEC Sample No.	Spike	10304 Spiked Sample	% Recovery
2-Chlorophenol	30.0	31.9	106
2,4-Dichlorophenol	25.0	24.7	99
2,4-Dimethylphenol	15.0	12.6	84
4,6-Dinitro-o-cresol	75.0	52.2	70
2,4-Dinitrophenol	----	----	----
2-Nitrophenol	25.0	25.6	102
4-Nitrophenol	----	----	----
p-Chloro-m-cresol	----	----	----
Pentachlorophenol	37.5	36.2	97
Phenol	25.0	15.2	61
2,4,6-Trichlorophenol	25.0	26.2	105

All concentrations expressed as µg/l.

Table XI.
Woodward Clyde Consultants - Project No. 85C7103
Firestone Tire & Rubber
Date Sampled 2/18/86
Metals - Quality Control Data

Lab No.	Parameter	Analysis #1	Analysis #2	Amt. of Spike	Spiked Analysis	Percent Recovery	Units
781-86	Arsenic	<4	----	50	47	94	ug/l
790-86		<4	----	50	45	90	ug/l
791-86		<4	<4	----	----	----	ug/l
781-86	Barium	290	----	2000	2060	89	ug/l
790-86		<50	----	2000	1710	86	ug/l
781-86	Cadmium	1	----	7.5	6.9	80	ug/l
790-86		<1	----	7.5	6.9	89	ug/l
791-86		4.8	4.6	----	----	----	ug/l
781-86	Chromium	21	----	50	61	84	ug/l
790-86		15	----	50	61	92	ug/l
791-86		<5	<5	----	----	----	ug/l
781-86	Lead	9	----	50	52	86	ug/l
790-86		18	----	50	68	100	ug/l
791-86		<3	<3	----	----	----	ug/l
781-86	Mercury	<0.3	----	2.0	2.0	100	ug/l
790-86		<0.3	----	2.0	2.2	110	ug/l
796-86		0.3	0.3	----	----	----	ug/l
781-86	Zinc	140	----	500	560	84	ug/l
790-86		170	----	500	590	84	ug/l
791-86		<10	<10	----	----	----	ug/l

Table VII. (Cont'd.)
Woodward Clyde Consultants - Project No. 85C7103
Firestone Tire & Rubber
Date Sampled 2/19/86
Metals Analysis

ATEC No.	790-86	791-86	792-86
Identification	ALB-PW-2-3	ALB-OW-2-3 FIELD BLANK	SURWAT-10-1U-3
Arsenic, ug/l	<4	<4	4
Barium, ug/l	<50	<50	<50
Cadmium, ug/l	<1	4.7	<1
Chromium, ug/l	15	<5	<5
Lead, ug/l	18	<3	4
Mercury, ug/l	<0.3	<0.3	<0.3
Zinc, ug/l	170	<10	100

ATEC No.	793-86	794-86	795-86
Identification	SURWAT-10-1D-3	SURWAT-10-2D-3 DUPLICATE	ALB-TB-1-3 TRIP BLANK
Arsenic, ug/l	<4	<4	<4
Barium, ug/l	<50	<50	<50
Cadmium, ug/l	<1	<1	<1
Chromium, ug/l	<5	<5	<5
Lead, ug/l	6	5	<3
Mercury, ug/l	0.3	<0.3	<0.3
Zinc, ug/l	150	150	<10

ATEC No.	797-86
Identification	SURWAT-13-1D-3
Arsenic, ug/l	<4
Barium, ug/l	<50
Cadmium, ug/l	<1
Chromium, ug/l	47
Lead, ug/l	4
Mercury, ug/l	0.3
Zinc, ug/l	120

Table VII.
Woodward Clyde Consultants - Project No. 85C7103
Firestone Tire & Rubber
Date Sampled 2/18/86
Metals Analysis

ATEC No. / Identification	781-86 MW-12-1-3	782-86 BMW-3-3	783-86 ALB-PW-1-3
Arsenic, ug/l	<4	<4	<4
Barium, ug/l	290	90	70
Cadmium, ug/l	1	<1	<1
Chromium, ug/l	21	17	13
Lead, ug/l	9	<3	<3
Mercury, ug/l	<0.3	<0.3	<0.3
Zinc, ug/l	140	70	10

ATEC No. / Identification	784-86 ALB-OW-1-3	785-86 MW-1-1-3	786-86 MW-7-3-3
Arsenic, ug/l	<4	<4	<4
Barium, ug/l	<50	70	85
Cadmium, ug/l	<1	<1	<1
Chromium, ug/l	<5	<5	<5
Lead, ug/l	<3	<3	<3
Mercury, ug/l	0.3	<0.3	<0.3
Zinc, ug/l	<10	<10	120

ATEC No. / Identification	787-86 MW-7-4-3	788-86 BMW-2-3	789-86 ALB-PW-3-3 DUPLICATE PW-1-3 VMB
Arsenic, ug/l	<4	<4	<4
Barium, ug/l	500	170	<50
Cadmium, ug/l	<1	<1	<1
Chromium, ug/l	<5	<5	<5
Lead, ug/l	<3	<3	<3
Mercury, ug/l	<0.3	<0.3	<0.3
Zinc, ug/l	230	240	20

Table VII. (Cont'd.)
Woodward Clyde Consultants - Project No. 85C7103
Firestone Tire & Rubber
Date Sampled 2/19/86
Metals Analysis

ATEC No.	790-86	791-86	792-86
Identification	ALB-PW-2-3	ALB-OW-2-3 FIELD BLANK	SURWAT-10-1U-3
Arsenic, ug/l	<4	<4	4
Barium, ug/l	<50	<50	<50
Cadmium, ug/l	<1	4.7	<1
Chromium, ug/l	15	<5	<5
Lead, ug/l	18	<3	4
Mercury, ug/l	<0.3	<0.3	<0.3
Zinc, ug/l	170	<10	100

ATEC No.	793-86	794-86	795-86
Identification	SURWAT-10-1D-3	SURWAT-10-2D-3 DUPLICATE	ALB-TB-1-3 TRIP BLANK
Arsenic, ug/l	<4	<4	<4
Barium, ug/l	<50	<50	<50
Cadmium, ug/l	<1	<1	<1
Chromium, ug/l	<5	<5	<5
Lead, ug/l	6	5	<3
Mercury, ug/l	0.3	<0.3	<0.3
Zinc, ug/l	150	150	<10

ATEC No.	797-86
Identification	SURWAT-13-1D-3
Arsenic, ug/l	<4
Barium, ug/l	<50
Cadmium, ug/l	<1
Chromium, ug/l	47
Lead, ug/l	4
Mercury, ug/l	0.3
Zinc, ug/l	120

Figures and Tables

Environmental Site Assessment of Firestone Tire and Rubber Company Facility at Albany, Georgia

Prepared for:

The Firestone Tire and Rubber Company
1200 Firestone Parkway
Akron, Ohio 44317

Woodward-Clyde Consultants
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

Tables

LIST OF TABLES

TABLE 1. RESULTS OF HYDRAULIC CONDUCTIVITY (Permeability) TESTING
FIRESTONE - ALBANY, GEORGIA

WELL NO.	SCREENED DEPTH (Ft)	ESTIMATED PERMEABILITY
MW-1-1	49 - 59	1.09×10^{-5}
MW-1-2	25 - 35	1.46×10^{-5}
MW-1-3	55 - 65	4.24×10^{-6}
MW-1-4	23 - 33	2.10×10^{-6}
MW-1-5	50 - 60	1.35×10^{-4}
MW-7-4	29 - 39	4.63×10^{-5}
MW-7-8	25 - 35	1.80×10^{-5}
MW-12-1	16 - 26	9.14×10^{-5}
BMW-2	5 - 15	1.33×10^{-4}
BMW-3	36 - 46	1.17×10^{-5}
BMW-4	35 - 45	2.17×10^{-6}

NOTES:
1. Screened depth in feet below ground surface.
2. Hydraulic conductivity (permeability) in cm/sec.

TABLE 2. SUMMARY OF GROUNDWATER ELEVATIONS -- FIRESTONE - ALBANY, GA

Reference 3 page 30 of 37

WELL NO.	GROUND ELEV.	CASING ELEV.	02/17/86	03/24/86	05/27/86	09/19/86	10/15/86
MW-1-1	213.4	215.99	168.2	167.8	162.7	159.9	159.7
MW-1-2	214.0	216.80			189.0	187.6	186.0
MW-1-3	212.1	214.20			167.8	163.4	162.9
MW-1-4	212.6	214.10			188.3	183.6	182.6
MW-1-5	212.2	213.97			160.4	159.5	159.4
MW-1-6	214.5	216.41					[155.5]
MW-7-3	214.8	216.59	210.3	209.7	205.1	destroyed	
MW-7-4	214.8	217.68	191.0	197.2	188.4	replaced	[175.4]
MW-7-5	212.9	214.64			164.6	*	[163.3]
MW-7-7	213.8	217.10			168.8	destroyed	
MW-7-8	212.6	214.14			185.4	187.6	185.5
MW-9-1	212.2	214.87	[168.6]	[168.6]	[168.6]	[168.6]	[168.6]
MW-9-2	211.4	214.18	[177.9]	[177.9]	[177.9]	[177.9]	[177.9]
MW-12-1	206.3	208.88	201.1	198.9	196.7	197.1	197.2
BMW-2	210.5	213.61	205.5	205.4	204.1	203.1	202.7
BMW-3	214.0	215.94	200.9	195.7	186.0	186.1	189.4
BMW-4	217.1	219.41			190.3	184.7	184.0
RW-1	213.5	215.23					159.5
RW-2	214.1	215.19					160.5
RW-3	214.5	216.59					163.5
OW-1	-	217.34	164.3	165.1	157.0	*	154.8
OW-2	216.5	217.30	*	*	*	*	154.1

1. Elevations in feet above mean sea level.
2. OW-1 & OW-2 are deep observation wells in the Ocala aquifer; MW-1-1, MW-1-3, MW-1-5, RW-1, RW-2, and RW-3 are monitoring wells considered to be in the upper Ocala. All other wells in this list are in soil.
3. "*" means well not accessible for measurement on the date.
4. Blank space means well not installed at the time.
5. [168.6] = DRY WELL, shows well bottom elevation.

TABLE 3. SUMMARY OF MONITORING WELL PURGING METHODOLOGY
FIRESTONE - ALBANY, GEORGIA

WELL NO.	SAMPLE DATE	SAMPLING EQUIPMENT	PURGING EQUIPMENT	VOLUME PURGED
MW-1-1	18 FEB 86	Kemmerer	Bailer	1.6 gal
	25 MAR 86	Kemmerer	Bailer	2.1 gal
	29 MAY 86	BE/D Bailer	Bailer	1.1 gal
	16 OCT 86	BE/D Bailer	Bailer	0.8 gal
MW-1-2	29 MAY 86	BE/D Bailer	Bailer	2.1 gal
	16 OCT 86	BE/D Bailer	Bailer	1.1 gal
MW-1-3	29 MAY 86	BE/D Bailer	Bailer	4.0 gal
	16 OCT 86	BE/D Bailer	Bailer	2.9 gal
MW-1-4	29 MAY 86	BE/D Bailer	Bailer	2.6 gal
	16 OCT 86	BE/D Bailer	Bailer	1.1 gal
MW-1-5	29 MAY 86	BE/D Bailer	Bailer	5.3 gal*
	16 OCT 86	BE/D Bailer	Bailer	1.1 gal
MW-7-3	18 FEB 86	Kemmerer	Bailer	15.9 gal*
	25 MAR 86	Kemmerer	D-H Pump	20.0 gal
	29 MAY 86	BE/D Bailer	Bailer	1.8 gal
	16 OCT 86	--- Destroyed ---		
MW-7-4	18 FEB 86	Kemmerer	Bailer	2.9 gal
	25 MAR 86	Kemmerer	Bailer	7.1 gal
	29 MAY 86	BE/D Bailer	Bailer	2.1 gal
	16 OCT 86	--- Destroyed ---		
MW-7-5	29 MAY 86	BE/D Bailer	Bailer	0.3 gal
	16 OCT 86	--- Dry ---		
MW-7-7	29 MAY 86	BE/D Bailer	Bailer	1.1 gal
	16 OCT 86	--- Destroyed ---		
MW-7-8	29 MAY 86	BE/D Bailer	Bailer	4.8 gal*
	16 OCT 86	BE/D Bailer	Bailer	4.0 gal*
MW-12-1	18 FEB 86	Kemmerer	D-H Pump	25.0 gal
	25 MAR 86	Kemmerer	Bailer	4.0 gal
	29 MAY 86	BE/D Bailer	Bailer	4.0 gal
	16 OCT 86	BE/D Bailer	Bailer	5.3 gal
BMW-2	18 FEB 86	Kemmerer	Bailer	9.5 gal*
	25 MAR 86	Kemmerer	Bailer	9.2 gal*
	29 MAY 86	BE/D Bailer	Bailer	7.9 gal*
	16 OCT 86	BE/D Bailer	Bailer	1.3 gal

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TABLE 3. SUMMARY OF MONITORING WELL PURGING METHODOLOGY - Continued
FIRESTONE - ALBANY, GEORGIA

WELL NO.	SAMPLE DATE	SAMPLING EQUIPMENT	PURGING EQUIPMENT	VOLUME PURGED
BMW-3	18 FEB 86	Kemmerer	D-H Pump	10.0 gal
	25 MAR 86	Kemmerer	D-H Pump	7.0 gal
	29 MAY 86	BE/D Bailer	D-H Pump	1.5 gal
	16 OCT 86	BE/D Bailer	Bailer	3.4 gal
BMW-4	29 MAY 86	BE/D Bailer	Bailer	2.6 gal
	16 OCT 86	BE/D Bailer	Bailer	3.7 gal
RW-1	16 OCT 86	BE/D Bailer	Bailer	1.8 gal
RW-2	16 OCT 86	BE/D Bailer	Bailer	0.8 gal
RW-3	16 OCT 86	BE/D Bailer	Bailer	2.4 gal

NOTES:
1. All wells purged dry unless noted by "*"
2. "*" indicates purging of approximately 4 well volumes
3. BE/D = Bottom Entry/Discharge, Stainless Steel Bailer w/ Teflon check-valve
4. D-H Pump = 1.7-inch diameter, downhole hand-pump

albpurge

TABLE 36. SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
FIRST SAMPLING EVENT - 18 FEB 86
FIRESTONE - ALBANY, GEORGIA

	MW-1-1	MW-7-3	MW-7-4	MW-12-1	BMW-2	BMW-3	PW-1		OW-1	PW-2	TB-1
ARSENIC	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
BARIUM	0.070	0.085	0.50	0.29	0.17	0.09	0.07	<0.05	<0.05	<0.05	<0.05
CADMIUM	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
CHROMIUM	<0.009	<0.005	<0.005	0.021	<0.005	0.017	0.013	<0.005	<0.005	0.015	<0.005
LEAD	<0.003	<0.003	<0.003	0.009	<0.003	<0.003	<0.003	<0.003	<0.003	0.018	<0.003
MERCURY	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	0.0003	<0.0003	<0.0003
ZINC	<0.01	0.12	0.23	0.14	0.24	0.07	0.01	0.02	<0.01	0.17	<0.01
GASOLINE	9.3	*	*	*	*	*	*	*	*	*	*
VOLATILES											
Benzene	0.199	*	*	*	*	*	*	*	*	*	*
1,1-DCA	*	*	0.658	0.007	*	0.018	*	*	*	*	*
1,1-DCE	0.032	*	0.348	0.002	*	0.002	*	*	*	*	*
Ethylbenzene	0.327	*	*	*	*	*	*	*	*	*	*
1,1,1-TCA	0.042	*	0.020	0.012	*	0.001	*	*	*	*	*
Toluene	0.135	*	0.011	*	*	*	*	*	*	*	*
Xylenes	1.871	*	*	*	*	*	*	*	*	*	*
BASE/NEUTRALS	na	na	na				na	na	na	na	*
Bis(2-ethylhexyl) phthalate				0.0044	0.0047	0.0072					
ACIDS	na	na	na	*		*	na	na	na	na	*
4,6-Dinitro-o-cresol					0.0229						
Pentachlorophenol					0.0571						
ORGANOCHLORINE/PCB	na	na	na	*	*	*	na	na	na	na	*

NOTES:
1. Results expressed as mg/l (ppm)
2. Organic compounds shown only if detected in at least one sample
3. "*" denotes less than method detection limit (see Appendix B)
4. "na" denotes not analyzed
5. PW-1 (Production Well 1) sample included duplicate
6. TB-1 indicates trip blank

albgwql

TABLE 39. WATER PRODUCTION WELLS WITHIN THREE MILES OF FIRESTONE - ALBANY, GEORGIA

USGS GRID #	WELL NAME	LATITUDE	LONGITUDE	TOTAL DEPTH	AQUIFER
13L003	ALB-DOUGHERTY CO.	313313	840021	243	OCALA
13L005	ALBANY 19	313413	840603	965	--
13L007	ALBANY 25	313428	840449	960	MULTI
13L008	ALBANY 28	313615	840550	1010	--
13L014	MILLER BREW-OCALA 2	313549	840438	99	OCALA
13L015	FIREWELL SAC APRON	313621	840409	351	TALLAHATTA
13L016	MILLER BREWERY OW-2	313545	840445	560	TALLAHATTA
13L017	MILLER BREWERY OW-3	313606	840439	550	TALLAHATTA
13L018	USMC 03	313300	840512	1000	MULTI
13L019	USMC - ALBANY - 2	313252	840222	1040	MULTI
13L021	MILLER BREWERY PW-2	313547	849440	560	TALLAHATTA
13L022	MILLER BREWERY PW-3	313610	840438	550	TALLAHATTA
13L025	USMC 01	313305	840326	1050	OCALA
13L026	MILLER BREWERY PW-1	313528	840447	1120	MULTI
13L027	MILLER BREWERY OW-1	313528	840452	1120	LISBON
13L031	FLEMING FARM 10	313139	840240	290	OCALA (?)
13L032	FLEMING FARM 09	313209	840250	285	OCALA (?)
13L035	FLEMING FARM 06	313148	840322	295	OCALA (?)
13L036	FLEMING FARM 05	313226	840324	260	OCALA (?)
13L037	FLEMING FARM 03	313126	840352	280	OCALA (?)
13L038	FLEMING FARM 02B	313215	840344	300	OCALA (?)
13L040	AG TIMBER MNGT FCP11	313221	840406	950	--
13L045	FIRESTONE P1	313403	840312	265	OCALA
13L046	FIRESTONE P2	313343	840312	284	OCALA
13L049	MILLER AMMO SUPPLY	313521	840510	170	OCALA
13L051	FLEMING (FCO&FOO 11)	313223	840406	297	OCALA (?)
13L052	MILLER OCALA 3	313609	840435	105	OCALA
13L054	PERKINS, WILLIAM H.	313643	840217	--	--
13L057	BOUCHER, FRANK	313347	840211	150	OCALA
13L058	CANDLER, W.M.	313556	840216	173	OCALA (?)
13L065	B & S TRAILER	313422	840323	200	OCALA
13L068	B & S TRAILER	313425	840323	213	OCALA
13L072	A.C. SEARLES	313422	840238	236	OCALA
13L146	N. HALTON	313424	840257	180	OCALA

NOTES: 1. Data from written and verbal communication with Mr. John Clarke, USGS - Atlanta, Georgia

2. Aquifer with (?) not identified but depth consistent with Ocala

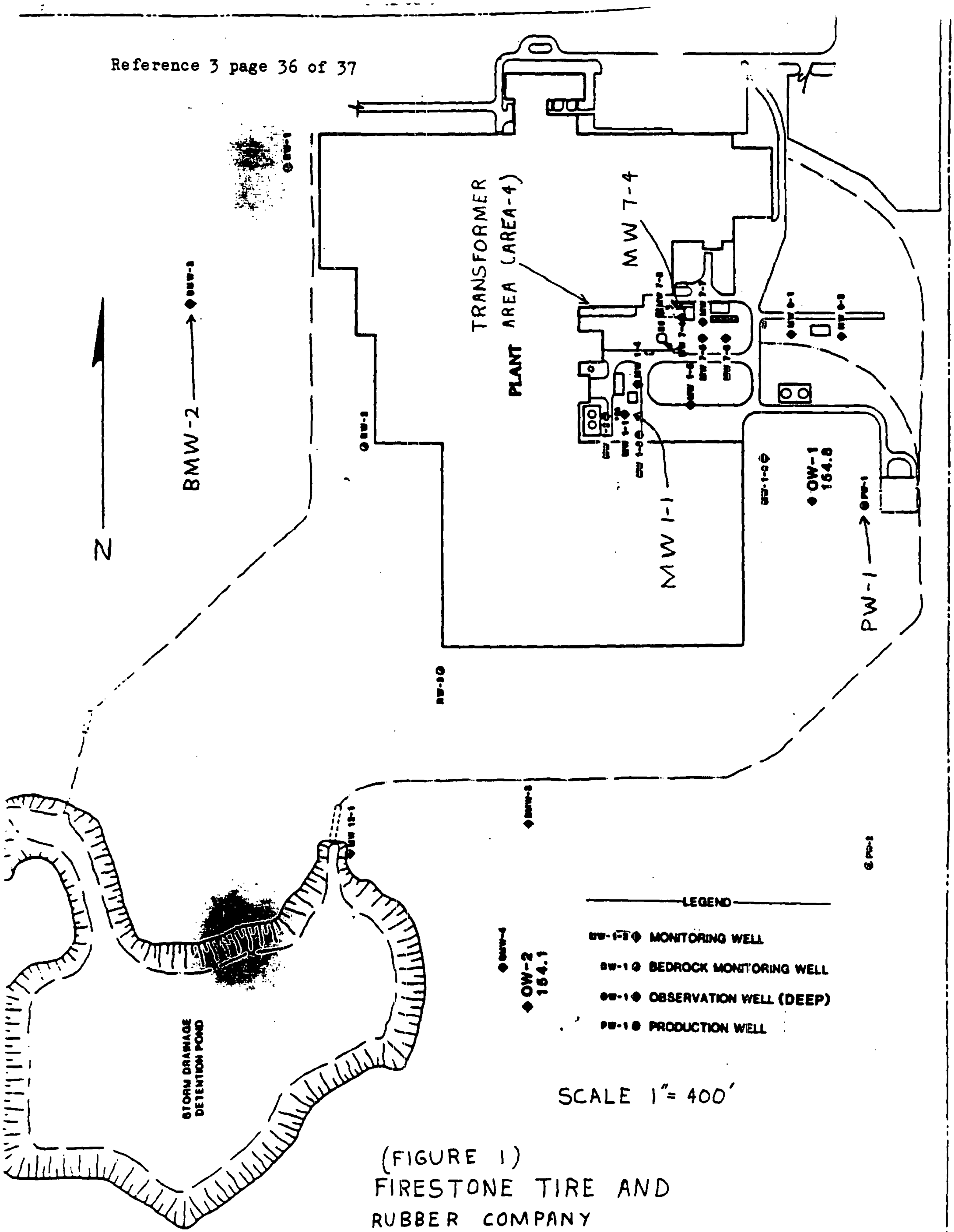
albwell

TABLE 40. WATER PRODUCTION WELLS DEVELOPED IN THE OCALA AQUIFER AND WITHIN THREE MILES OF FIRESTONE - ALBANY, GEORGIA

USGS GRID #	WELL NAME	LOCATION			USE	CASING DEPTH	TOTAL DEPTH
13L003	ALB-DOUGHERTY CO.	3.0	E-SE	Upgradient	uncertain	206	243
13L014	MILLER BREW-OCALA 2	2.2	NW	Upgradient	Process	84	99
13L025	USMC 01	1.0	S	Downgradient	Process	--	1050
13L031*	FLEMING FARM 10	2.2	S	Downgradient	Agricult.	70	290
13L032*	FLEMING FARM 09	2.1	S	Downgradient	Agricult.	93	285
13L035*	FLEMING FARM 06	2.5	S	Downgradient	Agricult.	148	295
13L036*	FLEMING FARM 05	1.7	S	Downgradient	Agricult.	70	260
13L037*	FLEMING FARM 03	2.9	S	Downgradient	Agricult.	118	280
13L038*	FLEMING FARM 02B	1.9	S	Downgradient	Agricult.	70	300
13L045	FIRESTONE P1	+		[On site]	Process	165	265
13L046	FIRESTONE P2	+		[On site]	Process	150	284
13L049	MILLER AMMO SUPPLY	2.3	NW	Upgradient	Potable	103	170
13L051*	FLEMING (FCO&FOO 11)	1.9	S-SW	Downgradient	Agricult.	60	297
13L052	MILLER OCALA 3	2.5	N-NW	Upgradient	Process	60	105
13L057	BOUCHER, FRANK	1.1	E-SE	Upgradient	Potable	nr	150
13L058*	CANDLER, W.M.	2.2	N-NE	Upgradient	Potable	62	173
13L065	B & S TRAILER	0.1	N	Upgradient	Potable	135	200
13L068	B & S TRAILER	0.1	N	Upgradient	Potable	159	213
13L072	A.C. SEARLES	0.7	NE	Upgradient	Potable	199	236
13L146	N. HALTON	0.4	NE	Upgradient	Potable	84	180

NOTES:
1. "+" = Located on Firestone property
2. "*" = Actual aquifer not reported - depth of well is consistent with depths of other Ocala wells.
3. Location is in miles from plant site and relative to groundwater flow
4. Depth is in feet below ground surface.
5. "nr" indicates not reported

albwell



(FIGURE 1)
FIRESTONE TIRE AND
RUBBER COMPANY

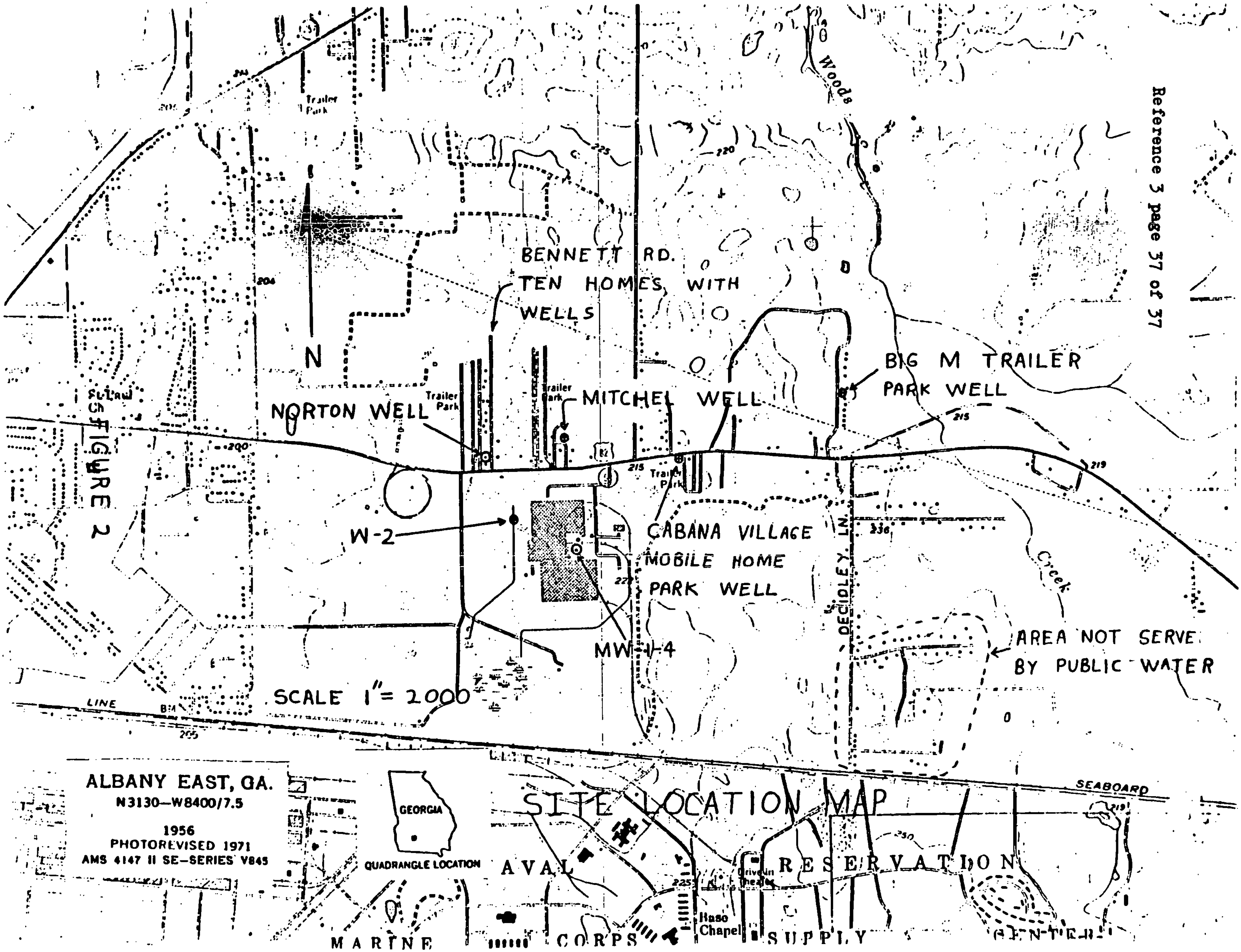


FIGURE 2
N
BENNETT RD.
TEN HOMES WITH
WELLS
NORTON WELL
MITCHEL WELL
BIG M TRAILER
PARK WELL
W-2
CABANA VILLAGE
MOBILE HOME
PARK WELL
MW-1-4
DECIDLEY LN.
AREA NOT SERVE
BY PUBLIC WATER
SCALE 1" = 2000
Trailer Park
Woods
Creek
LINE
SEABOARD
SITE LOCATION MAP
ALBANY EAST, GA.
N3130—W8400/7.5
1956
PHOTOREVISED 1971
AMS 4147 II SE—SERIES V845
GEORGIA
QUADRANGLE LOCATION
AVAL RESERVATION
Drive-in Theater
Base Chapel
MARINE CORPS SUPPLY CENTER

Reference 4

RECORD OF TELEPHONIC CONVERSATION

Site Investigation Program

Routing: [handwritten signature]

Date: 6/25/87

Time: 2:37 ~~a.m.~~/p.m.

File: FIRESTONE TIRE AND RUBBER CO.

Party Spoken To: ROBERT S. GLOWACKY

Title: LABORATORY MANAGER

Agency/Company: AQUA TECH ENVIRONMENTAL CONSULTANTS

Address: P.O. BOX 76

City: MELMORE

Telephone Number: (419) 397 - 2659

State/Zip: OHIO 44845

Subject: GROUND WATER SAMPLES FROM FIRESTONE TIRE AND RUBBER COMPANY, ALBANY, GA

Summary of Call:

MR. GLOWACKY STATED THE FOLLOWING:

1. ALL ORGANIC ANALYSIS WAS DONE BY USEPA METHODS.
2. THE INSTRUMENT DETECTION LIMITS WERE LESS THAN OR EQUAL TO THE METHOD DETECTION LIMIT.
3. MR. GLOWACKY SAID THAT HE HAD A HIGH LEVEL OF CONFIDENCE IN THE LABORATORY DATA.

Actions Required: NONE

Signature: [signature] 6/25/87

Follow-up Responses/Additional Comments:

Signature:

Date:

SIP-2 9/86

Reference 5

RECORD OF TELEPHONIC CONVERSATION
Site Investigation Program

Routing: Reviewed by Mike Allred

Date: 6/25/87

Time: 2:04 ~~a.m.~~/p.m.

File: FIRESTONE TIRE AND RUBBER CO.

Party Spoken To: JEFFREY A. SMITH

Title: LABORATORY MANAGER

Agency/Company: AQUA TECH ENVIRONMENTAL CONSULTANTS

Address: 181 SOUTH MAIN ST.

City: MARION

Telephone Number: (614) 382 - 5991

State/Zip: OHIO 43302

Subject: GROUND WATER SAMPLES FROM FIRESTONE TIRE AND RUBBER COMPANY, ALBANY, GA.

Summary of Call:

MR. SMITH STATED THE FOLLOWING:

1. THE INORGANIC ANALYSIS WAS DONE USING EPA METHODS.
2. MR SMITH STATED THAT THE LOWER DETECTION LIMITS WERE ESTABLISHED BY BLANK DETERMINATION AND ~~STATICAL~~ STATISTICAL ANALYSIS.
3. MR. SMITH SAID THAT HE HAD A HIGH LEVEL OF CONFIDENCE IN THE SAMPLE DATA.

Actions Required: NONE

Signature: Charles P. Evans

Follow-up Responses/Additional Comments:

Signature:

Date:

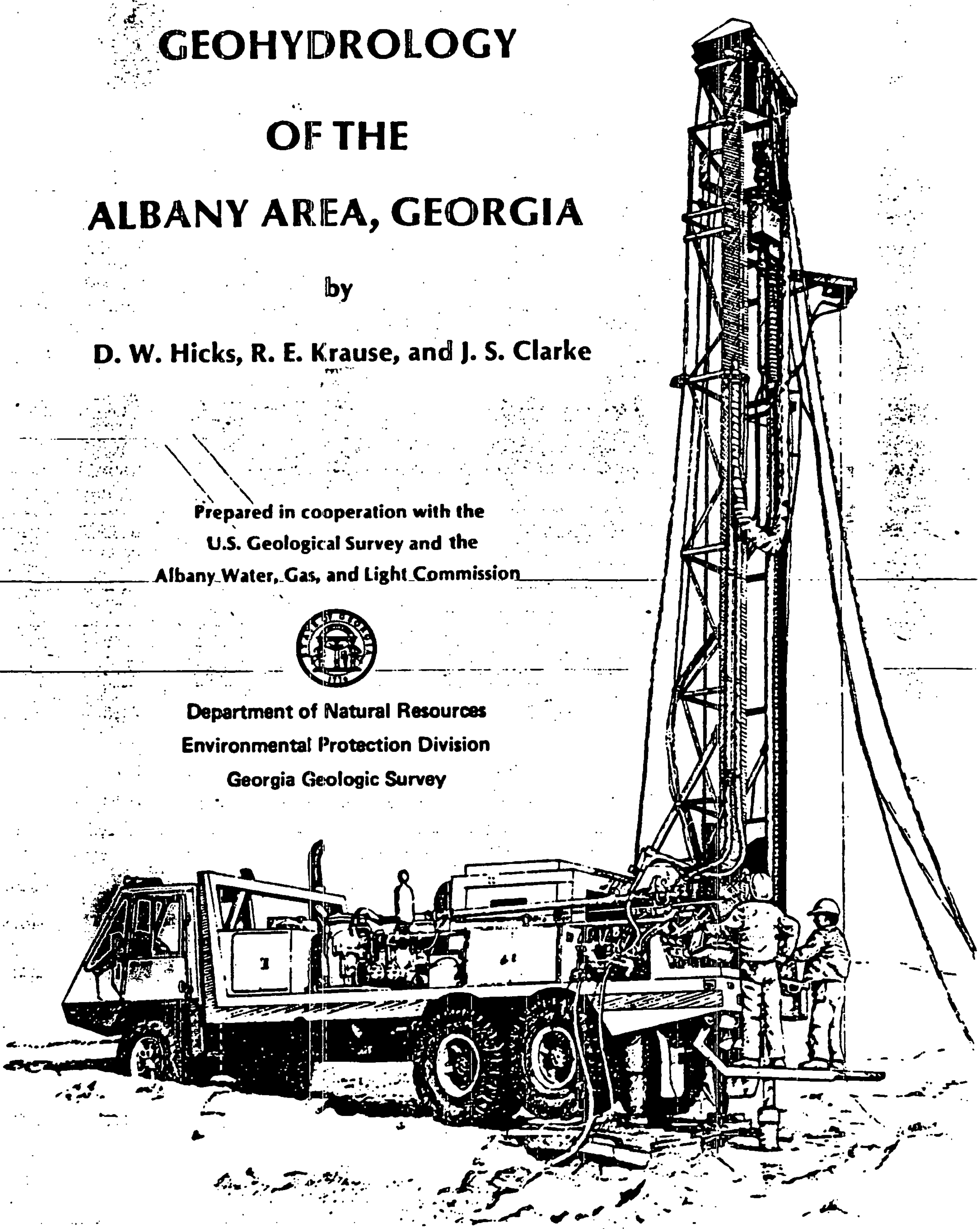
GEOHYDROLOGY OF THE ALBANY AREA, GEORGIA

by

D. W. Hicks, R. E. Krause, and J. S. Clarke

Prepared in cooperation with the
U.S. Geological Survey and the
Albany Water, Gas, and Light Commission

Department of Natural Resources
Environmental Protection Division
Georgia Geologic Survey



INFORMATION CIRCULAR 57

The top of the Hatchetigbee-Tallahatta-Lisbon sequence dips to the southeast at approximately 10 ft/mi (fig. 6) and undergoes a marked increase in thickness downdip (fig. 2). The thickness of this sequence ranges from about 235 ft in the northwest part of the area to about 340 ft in the southeast.

Ocala Limestone

The Ocala Limestone comprises the upper Eocene Jackson Group in the report area and unconformably overlies the Lisbon Formation. The Ocala Limestone crops out in the study area along the Flint River and Kinchafoonee, Muckalee, and Piney Woods Creeks where erosion has removed the overburden.

The basal section of the Ocala consists of a tough fine- to medium-grained recrystallized, dolomitic, moderately fossiliferous limestone. The limestone is more sandy in the middle of the section where fossils are less abundant. Limestone near the top of the section is variably fine to coarse grained, chalky, and coarsely fossiliferous (P. F. Huddlestun, oral commun., 1980).

The Ocala dips slightly to the southeast at 2 to 5 ft/mi and generally thickens in that direction. The formation ranges in thickness from about 150 to 200 ft throughout the report area.

Residuum

Most of the Dougherty Plain part of the report area is covered by 40 to 70 ft of unconsolidated residuum developed from weathering of the Ocala Limestone and Oligocene limestones. This residuum is generally a red sandy clay that, in the southeast part of the area, may contain siliceous boulders as large as 3 ft in diameter. The flood plain of the Flint River is covered by 20 to 70 ft of unconsolidated river-terrace deposits.

HYDROLOGY

Water in the Albany area is obtained primarily from four ground-water reservoirs, or aquifers (table 1). From deepest to shallowest, the aquifers are: the Providence, Clayton, Tallahatta, and Ocala. Although ground water is present in the underlying Cusseta Sand, high drilling costs, low yields, and excessive concentrations of chloride and dissolved solids make development of this unit undesirable.

Recharge waters enter the aquifers where they occur near land surface and percolate downgradient to become confined between relatively impermeable beds of clay, sandy clay, or shale. Thus, confined ground water is under a constant pressure known as hydrostatic, or artesian, pressure. When a well penetrates a confined aquifer downdip from the recharge area, artesian pressure causes the water in the aquifer to rise above the top of the aquifer. An imaginary surface connecting points to which water would rise in tightly cased wells is called the potentiometric surface (Lohman, 1972, p. 8). The altitude of the potentiometric surface is controlled by the artesian pressure and is a function of the rate of recharge, the hydraulic gradient (slope of the imaginary water surface), and the rate of discharge.

The transmissivity of an aquifer is defined as the rate at which water will flow through a unit width of material under a unit hydraulic gradient. It is, thus, a measure of the aquifer's ability to transmit water. Transmissivities used in this report are estimated from specific capacity data and, because of well losses, are generally lower than values calculated from aquifer tests. The hydraulic conductivity is also a term used to define the water-transmitting ability of an aquifer. Like the transmissivity, it is influenced primarily by permeability and hydraulic gradient, but is also influenced by the viscosity of the water.

The ability of many carbonate aquifers to transmit water is enhanced by the development of secondary permeability. Circulating ground water containing carbon dioxide dissolves calcium carbonate along joints and bedding planes in the aquifer, thus enlarging the primary flow channels as well as creating new channels.

Aquifer Properties

Providence Aquifer

The Providence aquifer receives recharge where it occurs near land surface along a northeast-trending line about 50 mi north-northwest of Albany. Ground water is confined in the aquifer from below by the dense clay of the Ripley Formation, and from above by the silty upper Providence-lower Clayton sequence (fig. 2). Ground water is obtained from the Providence aquifer in the Albany area at depths ranging from about 640 to 960 ft below land surface.

Artesian pressure in the Providence was sufficient during 1978 to produce an average water level of about 110 ft below land surface at well 95-08 at Albany, near the center of municipal pumpage. Water levels become higher with increased distance from the pumping center.

Estimates of transmissivity for the Providence aquifer range from about 250 ft^2/d at well 95-01, 3 mi southeast of Albany, to 1,000 ft^2/d at well 95-48, approximately 12 mi updip to the northwest. The hydraulic conductivity is lowest in the upper part of the formation and highest in the coquina bed (fig. 2) where most of the water is produced. The Providence yields less than 25 gal/min to wells in the south and southeast parts of the report area where the transmissivity is low; however, updip to the northwest, yields to wells of about 500 gal/min have been reported.

The Providence aquifer produces a soft sodium bicarbonate type water that contains no constituent concentrations that exceed the Georgia Environmental Protection Division standards (1977) for safe drinking water (table 2). The average calcium, magnesium hardness of 6 mg/L (milligrams per liter) and low average dissolved iron concentration of 50 ug/L (micrograms per liter) make water from this aquifer ideal for domestic use.

Clayton Aquifer

The Clayton aquifer is recharged primarily where it occurs near land surface and where the formation is exposed in steep valley walls along a northeast-trending line about 35 to 40 mi north-northwest of Albany. The topography of the Clayton recharge area is not conducive to the influx of large quantities of water. Ground water is obtainable from the Clayton aquifer in the Albany area at depths ranging from about 550 to 840 ft below land surface. The Clayton is artesian in the Albany area and water in the aquifer is confined from below by the silty upper Providence-lower Clayton sequence and from above by the clayey Tuscahoma Sand.

During 1978 the Clayton aquifer had an average water level of 140 ft below land surface at well 95-06 (pl. 1) near the center of pumpage in Albany. This was the lowest water level recorded in the Albany area.

Figure 7 shows how the transmissivity of the Clayton aquifer varies laterally, increasing from the area east of Albany, northwest to Sasser. Estimates of transmissivity, made from specific-capacity data (Lohman, 1972, p. 52), range from about 200 ft^2/d at well 95-07, approximately 3 mi southeast of Albany, to about 11,000 ft^2/d at well 273-03, to the northwest at Sasser. Yields to wells tapping the Clayton aquifer, like those of the Providence, vary areally. Well 95-09, approximately 3 mi northeast of Albany, produces about 250 gal/min, whereas well 273-05 near Sasser has a reported production of about 2,000 gal/min. This progressive increase in transmissivity and yield toward the northwest is due largely to a directional increase in hydraulic conductivity and the thickening of the water-bearing part of the Clayton Formation.

Water from the Clayton aquifer generally is a soft sodium bicarbonate type that contains no constituent concentrations that exceed the State standards (1977) for drinking water (table 2). Although the average dissolved iron concentration of 152 ug/L is higher than that in the Providence aquifer, the level is not excessive and has not been reported to cause staining or encrustation problems.

The sodium bicarbonate water in the Clayton aquifer is nontypical of carbonate aquifers, which generally yield water of a calcium bicarbonate type. The uncharacteristically high concentration of sodium (average 44 mg/L) in water from the Clayton in Albany could result from the leakage of sodium bicarbonate water from the underlying Providence aquifer.

Tallahatta Aquifer

The Tallahatta aquifer is recharged primarily by rainfall where the sediments occur near land surface along a northeast-trending line 20 to 30 mi north-northwest of Albany. The Tallahatta aquifer is comprised of several hydraulically interconnected water-bearing zones in the Hatchetigbee-Tallahatta-Lisbon sequence. Ground water can be obtained from this aquifer in the Albany area at depths ranging from about 125 to 350 ft below land surface. The aquifer is confined from below by the clayey Tuscahoma Sand and from above by the upper part of the Lisbon Formation. During 1978, artesian pressure in the Tallahatta aquifer was sufficient to produce an average water level at well 95-05, near the center of pumpage in Albany, of about 90 ft below land surface.

Limited areal testing indicates that the transmissivity and yield of the Tallahatta aquifer does not vary significantly in the Albany area. Estimates of transmissivity, made from specific-capacity data, range from about 2,400 to 3,500 ft^2/d. The water-bearing potential of the Tallahatta aquifer is good where tested and yields to wells of 1,000 to 1,400 gal/min have been reported. However, the relatively low transmissivity of the aquifer results in large drawdowns when pumpage exceeds about 750 gal/min.

The Tallahatta aquifer produces a hard calcium bicarbonate type water that contains no constituent concentrations that exceed the State 1977 drinking water standards (table 2). The dissolved calcium concentration ranges from 18 to 52 mg/L and is uncharacteristically high for a predominantly sand aquifer. Although dissolution of calcite could account for part of the dissolved calcium, the relatively high calcium levels observed in water samples from the Tallahatta aquifer in the Albany area could result from the vertical leakage of calcium bicarbonate water from the overlying Ocala aquifer.

Ocala Aquifer

The Ocala aquifer is recharged, in the Albany area and throughout much of the Dougherty Plain, chiefly by the infiltration of rainfall. The Ocala is generally covered in the Dougherty Plain area by a thin layer of unconsolidated residuum ranging in thickness from about 40 to 70 ft. Where the residuum is present, the aquifer is confined and is artesian; where the residuum has been removed by stream erosion or through sinkhole collapse, the aquifer is unconfined. Because of the varying conditions of confinement and pressure, average water levels in the Ocala during 1978 ranged areally from about 2 ft above land surface to 45 ft below.

Aquifer tests show that in areas near the Flint River where the Ocala Limestone is very cavernous, the transmissivity may exceed 100,000 ft^2/d (L. R. Hayes, oral commun., 1980). This high transmissivity allows the movement of large quantities of ground water, and yields to wells of 2,000 gal/min have been reported. However, away from the river in areas where solution openings are not well developed and to the northwest where the aquifer is thinner, the transmissivity of the Ocala can be as low as 2,000 ft^2/d and wells are reported to produce about 500 gal/min.

Water from the Ocala aquifer is moderately hard and is classified as a calcium bicarbonate type (table 2). Water samples from wells 95-22, near the Worth-Dougherty County line, and 95-24, at the Herty Nursery in Albany, had higher concentrations of nitrate than samples from the underlying aquifers. Well 95-24 produced water having a nitrate concentration of 6.10 mg/L, the highest level detected in the report area. These anomously high nitrate concentrations probably are due to the leaching of soil which has been treated with nitrogen-base fertilizer.

Water from the Ocala generally is of good chemical quality and contains no constituent concentrations that exceed 1977 State drinking water standards. However, the quality of the water could change rapidly in areas where the aquifer is unconfined or is in direct contact with surface water.

Influence of the Flint River

During periods of normal streamflow, the Ocala aquifer discharges into the Flint River through cavernous zones in the limestone that have been exposed by stream erosion. Figures 8 and 9 are graphs showing precipitation and the stage of the Flint River at Albany during 1978. Comparison of these figures shows the effect of heavy rainfall on the Flint River. When the river stage is increased, ground water that normally discharges into the river backs up into the aquifer, causing the water level to rise in Ocala wells near the river. Extended periods of heavy rainfall cause the river stage to rise above the altitude of the potentiometric surface in the Ocala aquifer. When this occurs, normal ground-water discharge points become recharge points and river water rapidly enters the cavernous zones in the aquifer. Comparison of figure 10 with figure 9 shows that the water level in well 95-03, 4 mi southeast of Albany and about 1.7 mi east of the Flint River, is very "flashy" and responds almost instantaneously to significant changes in river stage. By contrast at well 95-22, near the Worth-Dougherty County line and about 5.1 mi from the river, the altitude of the potentiometric surface of the Ocala aquifer is higher than the maximum river stage, and the water level in this well (fig. 11) is less affected by the increased stage of the river.

Leakage

Although rainfall entering the aquifers where they occur near land surface is the primary source of recharge, another source of recharge exists in the Albany area. Pumpage that reduces the head, or artesian pressure, in an aquifer may promote increased vertical flow through the confining beds separating the pumped aquifer from aquifers of higher artesian pressure. The amount of leakage per unit area depends on three factors: (1) the vertical hydraulic conductivity of the confining layer; (2) the thickness of the confining layer; and (3) the head difference between the aquifers. In and near the city of Albany, heavy pumpage from the Providence, Clayton, and Tallahatta aquifers has produced head differences that could enhance leakage. Water-quality analyses indicate that water may be leaking from the Providence aquifer into the Clayton and from the Ocala aquifer into the Tallahatta. Additional test drilling and monitoring would be necessary to estimate the amount and areal extent of the leakage.

MULTIAQUIFER HYDROLOGY

When developed individually, the Providence, Clayton, and Tallahatta aquifers in the Albany area yield water to production wells in insufficient quantities to be cost efficient. For this reason, the city of Albany uses wells that tap two or more aquifers simultaneously. Multiaquifer wells maximize yield, and minimize drawdown and drilling costs. Throughout much of the Albany area, properly constructed multiaquifer wells can produce a sustained yield greater than 1,500 gal/min and generate smaller drawdowns than wells tapping a single aquifer.

Well Construction

The telescoping construction design of two typical multiaquifer wells is shown in figure 12. Construction of each well is begun by drilling and driving a large-diameter surface casing through the residuum. Drill-

Agricultural

Total irrigated cropland in the study area reported in the 1954 agricultural census was 200 acres. By 1978 the irrigated cropland had increased to about 8,650 acres. According to Pollard and others (1978), ground water represented about 92 percent of the water used for irrigation in 1977, and it is assumed that this percentage did not change appreciably for the 1978 crop season. Thus, during 1978 about 8,000 acres were irrigated by ground water.

The availability of sufficient ground water and the suitability of center-pivot systems has greatly enhanced the use of irrigation in the Albany area. The gentle slopes and large fields permit the use of self-propelled center-pivot irrigation systems. Many center-pivot systems used in the study area are designed to distribute water at rates of 1,000 to 1,500 gal/min and are capable of irrigating several hundred acres.

Ground water for irrigation in the Dougherty Plain province is obtained primarily from the Ocala aquifer. However, the Ocala is not productive to the northwest of Albany in parts of Dougherty, Terrell, and Calhoun Counties, and use of the Clayton aquifer for irrigation is rapidly increasing. Agricultural use of ground water is presently (1978) not regulated by the State of Georgia. Because permitting is not required, agricultural use of the Clayton is limited only by the productivity of the aquifer. Heavy withdrawals from the Clayton in this area could limit the availability of water from this aquifer.

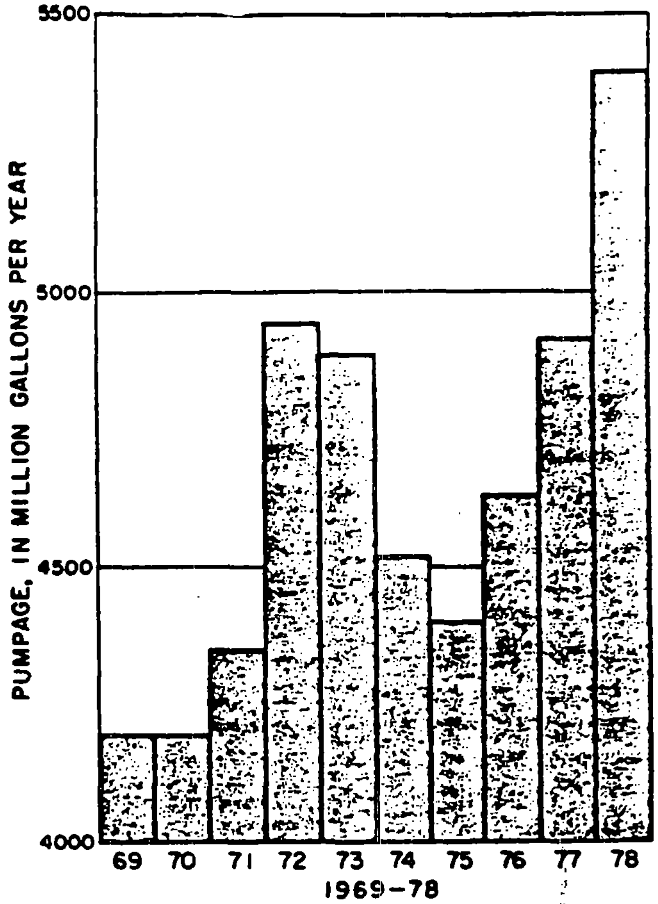


Figure 16.—Yearly ground-water withdrawal by Albany supply wells, 1969-78.

Municipal

In 1898 the city of Albany's water system pumped an estimated 25,000 gal/d from 14 wells (McCallie, 1898, p. 179-181). As municipal and industrial demands increased, more wells were drilled, and the city has used at least 30 wells since initiation of the Albany water system. The city of Albany was the largest single ground-water user in the study area during 1978, withdrawing a total of about 5.4 billion gallons per year, from 23 multiaquifer wells (fig. 16).

The increase in population and industry in the Albany area is reflected in the water requirements. Figure 16 shows that the annual ground-water demand has increased from about 4.2 billion gallons in 1969 to more than 5.4 billion gallons in 1978. On August 28, 1978, the ground-water withdrawal peaked at over 22 Mgal/d, the highest single day of pumpage recorded by the city of Albany (fig. 17).

The rate of ground-water withdrawal by the city varies seasonally and is greatest during the summer and fall. Figure 17 shows an increase in ground water withdrawals from April through October 1978. The duration of peak withdrawal periods and the amounts of withdrawal are influenced by climatic conditions; thus, increases in precipitation decrease the demand for city water.

Municipal Pumpage from the Providence, Clayton, and Tallahatta Aquifers

The total amount of water withdrawn from the Providence, Clayton, and Tallahatta aquifers was estimated for the Albany supply wells based on flowmeter tests and well construction data. Figure 18 shows that an average of about 0.9 Mgal/d was withdrawn from the Providence aquifer during 1978, or about 6 percent of the Albany municipal supply. The Clayton aquifer contributed about 45 percent of the city supply, or an average of about 6.8 Mgal/d. Approximately 7.3 Mgal/d was withdrawn from the Tallahatta aquifer during 1978, representing about 49 percent of the total Albany municipal pumpage.

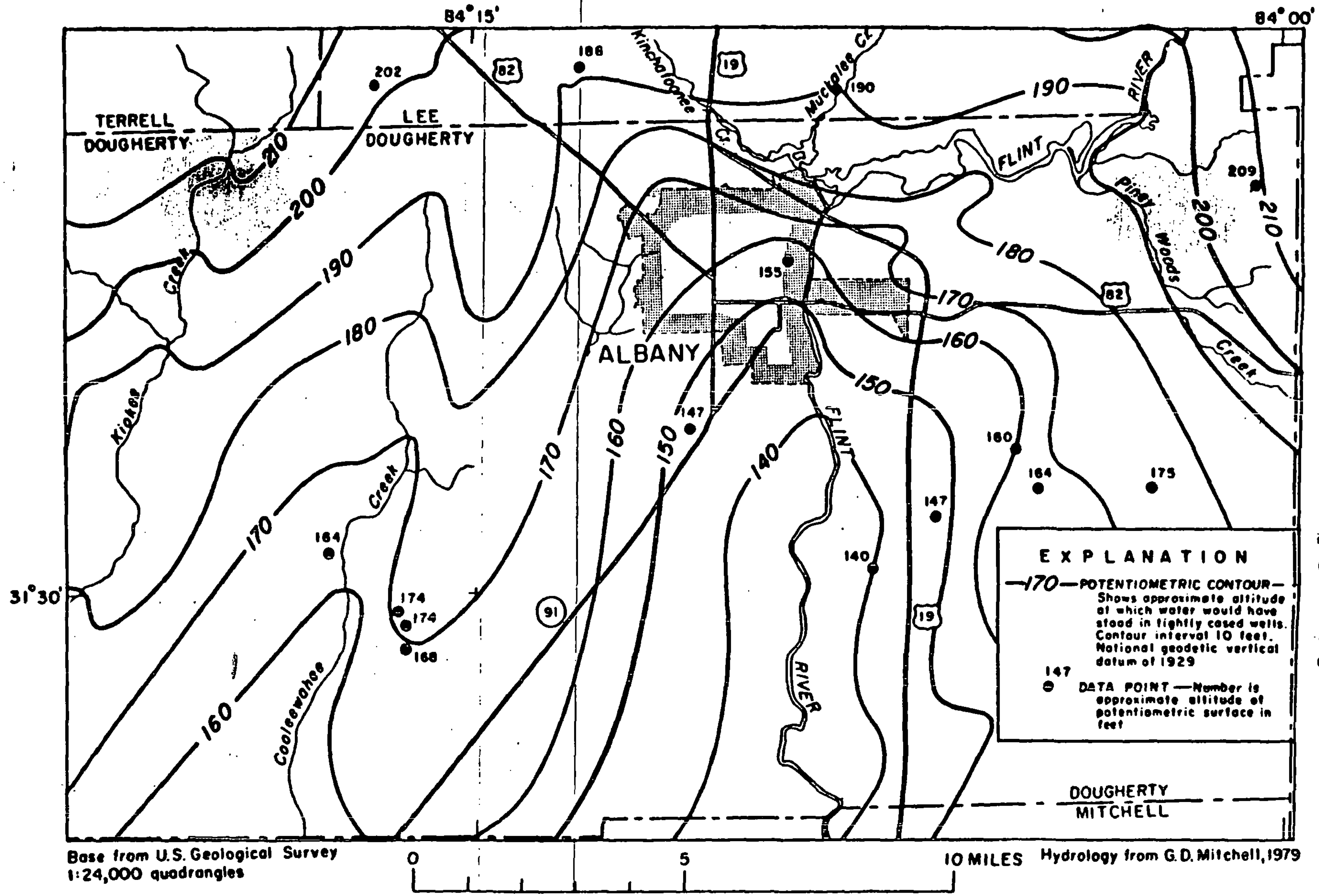


Figure 19. Potentiometric surface of the Ocala aquifer in the Albany area, November 1979.

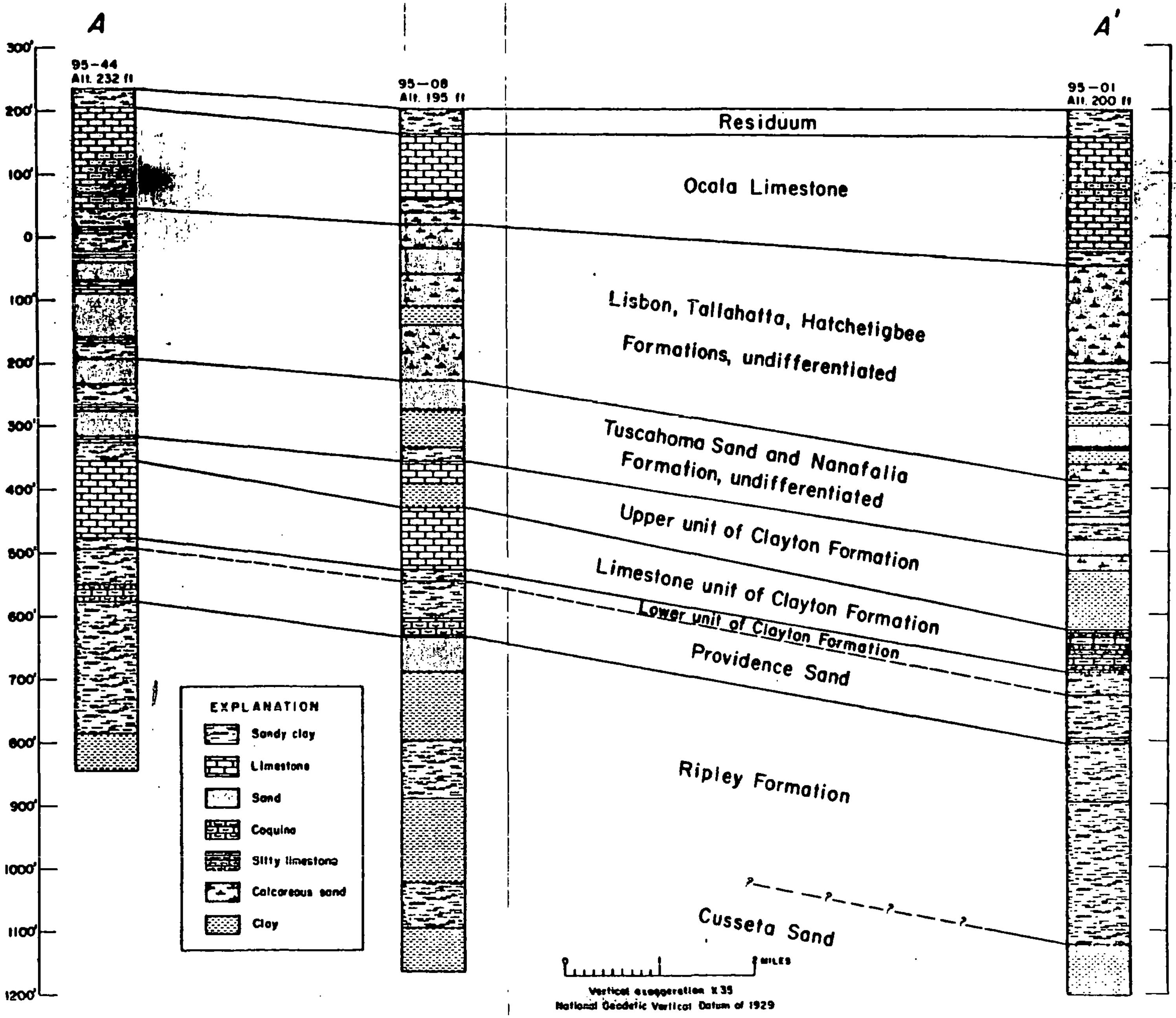


Figure 2. Geologic section of the Albany area.

Reference 6 page 7 of 8

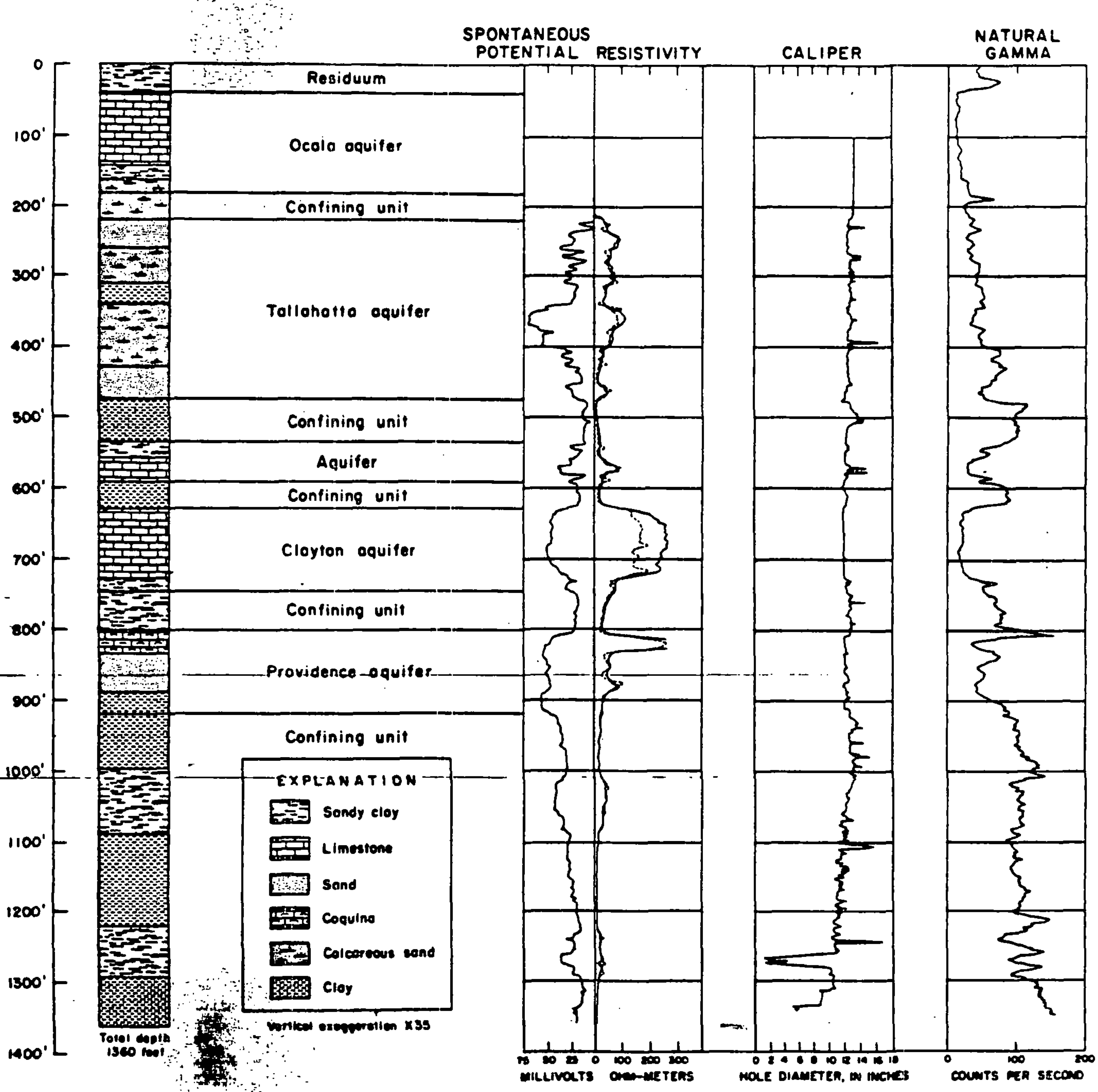


Figure 3. Stratigraphic section and geophysical well logs for well 95-08 at Albany.

PRELIMINARY ASSESSMENT
TELEPHONE CONVERSATION RECORD

Site Name: FIRESTONE TIRE + RUBBER CO. I.D.# GAD990855074

Location Address: 3300 SYLVESTER Rd. ALBANY, GA. 31715

Phone: (912)436 - 8861.

Contact: WAYNE B. COPE Title: ENVIRONMENTAL COORDINATOR

Address: SAME

Phone: (912)436 - 8861.

Authority: Section 3012 of CERCLA, Comprehensive Environmental Response, Compensation and Liability Act.

Facility has notified EPA via - RCRA 3001 site is in HWDMS
CERCLA 103c site is in NOTIS

Need Information concerning waste generation and disposal prior to Nov. 19, 1980.

How long has facility been in operation? SINCE 1968

What kind of wastes were generated and how much?

WASTE CEMENT CONTAINING NAPTHA (50%) AND AROMATIC SOLVENTS (50%)
A TOTAL of 950,000 POUNDS SINCE 1968. FROM 1968 - 1976 ALL WASTE (over)

Was it disposed on site and where?

SOLVENT LOST AT THREE LOCATIONS ON-SITE.

Was it transported offsite and where?

WASTE CEMENT ~~to landfill~~ + SOLVENT TO LANDFILL 68-76; FROM 76-80 WASTE CEMENT TO EMELLE, AL + SOLVENT TO RAMSEY CHEMICAL.

Was it treated and how?

WASTE SOLVENTS TO RAMSEY CHEMICAL IN VALDOSTA - FOR RECLAMATION.

Have there been any past spills? Describe.

AN ESTIMATED 110,000 POUNDS of NAPTHA + WASTE ~~cement~~ SOLVENTS ARE ESTIMATED TO HAVE BEEN LOST DUE TO SPILLAGE ON-SITE. 3 ACRES of CONTAMINATED SOIL.

Date of call: 8/27/85 Time: 1:10 PM

~~[illegible]~~

Charles P. [illegible]

Reviewed by Mike Allred

610,000 pounds

was disposed at the local landfill. From 1976-1980 the waste cement was shipped to Chemical Waste Management's facility in Emelle, AL. The aromatic solvents were shipped to Ramsey Chemical, in Valdosta, GA. for reclamation + return, a total of 230,000 pounds

The balance of the waste about 4,000 pounds is estimated to ~~be~~ have been lost due to spillage.

The facility has two deep wells on-site from which it obtains its process water. Both wells are 214' deep. ~~An~~ 97,971 gallons of water has been extracted in the previous six months. ~~≈ 16,300 gal / month~~

Reference 9

Georgia Department of Natural Resources
205 Butler Street, S.E., Floyd Towers East, Atlanta, Georgia 30334
J. Leonard Ledbetter, Commissioner
Harold F. Reheis, Assistant Director
Environmental Protection Division
(404) 656-4713

September 3, 1986

MEMORANDUM

TO: Mike Allred Mike Allred
Unit Coordinator
Site Assessment Unit

FROM: Charles P. Evans CPE
Environmental Specialist
Site Assessment Unit

SUBJ: Water systems using ground water from the Ocala Limestone within three miles of Firestone Tire and Rubber Company, Albany, Georgia 31705 (GAD990855074).

A review of file information from the Ground Water Program reveals three water systems using the Ocala Limestone for drinking water within three miles of the Firestone facility.

These systems are as follows:

Name	Population Served
Cabana Village Mobile Home Park	51
Big M Trailer Park	40
Sanborn Trailer Park	31
TOTAL POPULATION SERVED	122

The distance from the boundary of the Firestone property to Sanborn Trailer Park is less than three miles. However, the distance from contamination found during the sampling inspection 12/11/85 and the Sanborn Trailer Park well is greater than three miles. The U.S. Naval reservation to the south of the Firestone property uses three wells for their source of water. These wells are multi-aquifer wells, however, they do not draw from the Ocala Limestone.

CPE/mcw038
File - Firestone Tire and Rubber Company (GAD990855074)

TRIP REPORT

DATE: February 16, 1987

SITE NAME AND LOCATION:	Firestone Tire and Rubber Co. Albany, Georgia
EPA ID NUMBER:	GAD990855074
COUNTY:	Dougherty
TRIP BY:	Charles P. Evans Environmental Specialist Site Investigation Program
ACCOMPANIED BY:	NONE
DATE AND TIME OF INVESTIGATION:	February 5, 1987 8:00 a.m.-9:00 p.m.
OFFICIALS CONTACTED:	None

REFERENCE:
Meeting with Environmental Representatives of Firestone Tire and Rubber Company January 29, 1987

COMMENTS:
An intensified well and land irrigation survey was conducted within three miles of known ground water contamination on Firestone's facility in Albany, GA. The following facts were obtained (see site maps for all locations):

1. The Lobarton Farm lies 1.7 miles south of the site. From information supplied by the farm manager, Mr. Calvin Lail, Rt. 1 Box 82, Albany, GA 31705, 999 acres of the farm are irrigated from wells within three miles of the site that draws from the Ocala limestone (Principal Artesian Aquifer).

2. A to[illegible]72 homes with wells were located within three miles of the site. All residents of these homes that could be interviewed said that their wells were two hundred feet or less deep. This would put their source of water in the Ocala limestone.

3. The total target population of Big "M" Mobile Home Park, Cabana Village Mobile Home Park, and the above homes is 365 people.

4. Mrs Mitchel, 3219 Sylvester Rd., Albany, GA 31705; uses a well for her water supply. Mrs. Mitchel did not know the depth of her well. However, from the depths of the private wells in the surrounding area it is probable that the depth of Mrs. Mitchel's well does not extend below the Ocala limestone. This well is located north of the Firestone plant 1,950 feet from an area that Firestone has determined has contaminated ground water.

5. The well of Mr. Keith Norton, 240 Bennett Dr., Albany, Georgia 31705 is located within 1600 feet of an area of ground water contamination found during sampling at the facility by EPD personnel on 2/11/85.

CONCLUSION:
The total population drinking ground water from the Ocala limestone within three miles of the site is 364.4 people. The total acreage irrigated by wells within three miles of the site is 999. The equivalant population under the Mitre HRS system is 1,863 people.

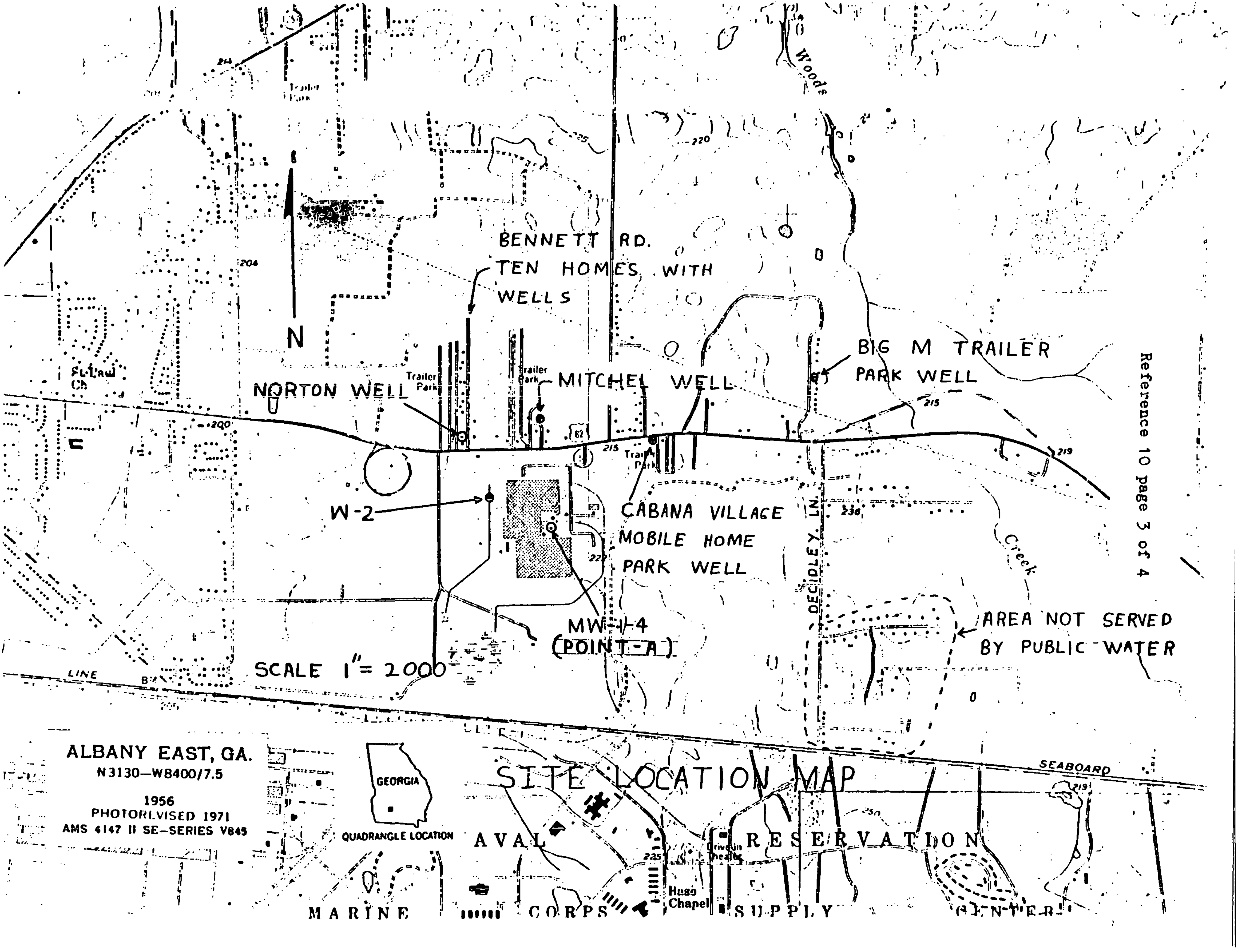
RECOMMENDATIONS AND FOLLOW-UP REQUIRED:
Revise HRS ranking of the site.

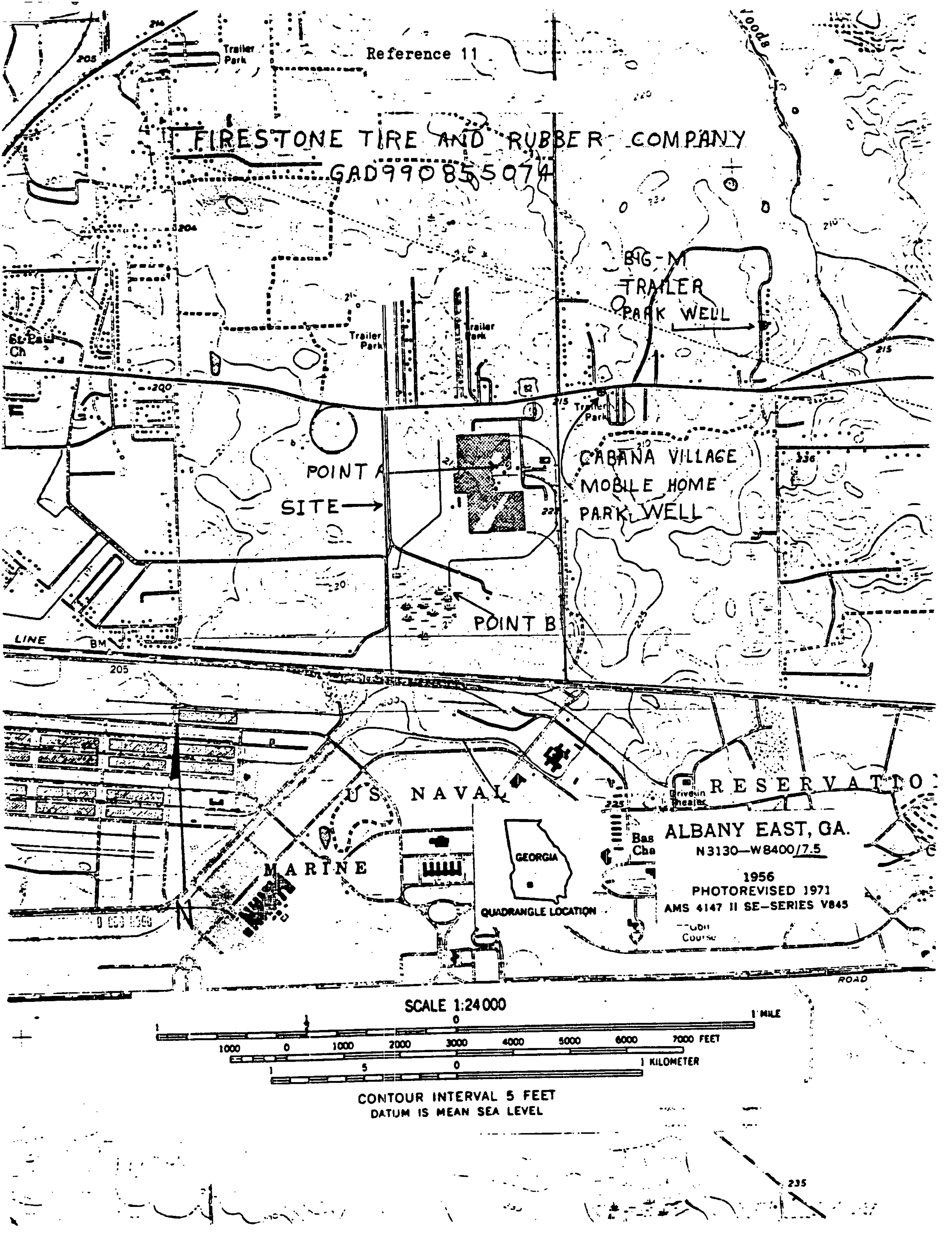
PHOTOGRAPHS: None

NUMBER OF WASTE/ENVIRONMENTAL SAMPLES TAKEN: None

REVIEWED BY: Mike Allred DATE: 6/30/87

ATTACHMENTS: SITE LOCATION MAP
SITE SKETCH


BENNETT RD.
TEN HOMES WITH WELLS
N
NORTON WELL
MITCHEL WELL
BIG M TRAILER PARK WELL
W-2
CABANA VILLAGE MOBILE HOME PARK WELL
MW-1-4 (POINT-A)
DECIDLEY LN.
AREA NOT SERVED BY PUBLIC WATER
SCALE 1" = 2000
Woods
Creek
Trailer Park
SEABOARD
LINE
SITE LOCATION MAP
MARINE CORPS SUPPLY CENTER
NAVAL RESERVATION
Drive-in Theater
Hugo Chapel
GEORGIA
QUADRANGLE LOCATION
ALBANY EAST, GA.
N3130—W8400/7.5
1956
PHOTOREVISED 1971
AMS 4147 II SE—SERIES V845



Reference 11
FIRESTONE TIRE AND RUBBER COMPANY
GAD990855074
BIG-M TRAILER PARK WELL
Trailer Park
St Paul Ch
POINT A
SITE
CABANA VILLAGE MOBILE HOME PARK WELL
POINT B
LINE
BM
US NAVAL RESERVATIO
MARINE
Drive-in Theater
GEORGIA
QUADRANGLE LOCATION
ALBANY EAST, GA.
N3130—W8400/7.5
1956
PHOTOREVISED 1971
AMS 4147 II SE—SERIES V845
ROAD
SCALE 1:24 000
1 MILE
7000 FEET
1 KILOMETER
CONTOUR INTERVAL 5 FEET
DATUM IS MEAN SEA LEVEL

ENDANGERED AND THREATENED SPECIES OF THE SOUTHEASTERN UNITED STATES

REGION 4
ATLANTA
GEORGIA

United States Department of the Interior
FISH AND WILDLIFE SERVICE
75 SPRING STREET, S.W.
ATLANTA, GEORGIA 30303

August 23, 1985

NOTICE

TO: All Project Leaders and Cooperators

FROM: Endangered Species Office, Federal Assistance, FWS, Atlanta, Georgia

SUBJECT: Changes to the Region 4 Endangered Species Notebook

This update covers the following actions: listing of the Carolina northern flying squirrel in North Carolina and Tennessee as endangered, listing of the Tar River spiny mussel in North Carolina as endangered, listing of five Florida pine rockland plants as endangered, listing of the Miccosukee gooseberry in Florida and South Carolina as endangered, listing of Ruth's golden aster in Tennessee and Vahl's boxwood in Puerto Rico as endangered, listing of the amber darter and Conasauga logperch in Georgia and Tennessee as endangered with critical habitat designated, reclassification of the alligator in Florida to threatened by similarity of appearance, and the proposed listing of two plants (pondberry and Florida golden aster).

REGIONAL LIST: Replace.

STATE LISTS: Replace FL, GA, NC, PR, SC, TN.

CRITICAL HABITAT: Replace index; add amber darter and Conasauga logperch designations for GA and TN.

PROPOSED RULEMAKING: Replace previous sheet.

Species Accounts: FISHES - Replace index; add accounts for two fishes.

PLANTS - Replace index; add accounts for eight plants.

Attachments

85-3

RECEIVED
AUG 26 1985
REGION IV
SENT TO

Federally Listed Species by State

GEORGIA

(E=Endangered; T=Threatened; CH=Critical Habitat determined)

Mammals	General Distribution
Bat, gray (Myotis grisescens) - E	Northwest, West
Bat, Indiana (Myotis sodalis) - E	Extreme Northwest
Manatee, Florida (Trichechus manatus) - E	Coastal waters
Panther, Florida (Felis concolor coryi) - E	Entire state
Whale, right (Eubalaena glacialis) - E	Coastal waters
Whale, finback (Balaenoptera physalus) - E	Coastal waters
Whale, humpback (Megaptera novaeangliae) - E	Coastal waters
Whale, sei (Balaenoptera borealis) - E	Coastal waters
Whale, sperm (Physeter catodon) - E	Coastal waters

Birds	
Eagle, bald (Haliaeetus leucocephalus) - E	Entire state
Falcon, American peregrine (Falco peregrinus anatum) - E	North
Falcon, Arctic peregrine (Falco peregrinus tundrius) - T	Coast, Northwest
Stork, wood (Mycteria americana) - E	Southeastern swamps
Warbler, Bachman's (Vermivora bachmanii) - E	Entire state
Warbler, Kirtland's (Dendroica kirtlandii) - E	Coast
Woodpecker, ivory-billed (Campephilus principalis) - E	South, Southwest
Woodpecker, red-cockaded (Picoides (=Dendrocopos) borealis) - E	Entire state

Reptiles	
Alligator, American (Alligator mississippiensis) - E	Inland coastal plain
Alligator, American (Alligator mississippiensis) - T	Coastal areas

GEORGIA (cont'd)

	General Distribution
Snake, eastern indigo (*Drymarchon corais couperi*) - T	Southeast
Turtle, Kemp's (Atlantic) ridley (*Lepidochelys kempii*) - E	Coastal waters
Turtle, green (*Chelonia mydas*) - T	Coastal waters
Turtle, hawksbill (*Eretmochelys imbricata*) - E	Coastal waters
Turtle, leatherback (*Dermochelys coriacea*) - E	Coastal waters
Turtle, loggerhead (*Caretta caretta*) - T	Coastal waters

Fishes

Darter, amber (*Percina antesella*) - E,CH	Conasauga R., Murray County
Darter, snail (*Percina tanasi*) - T	S. Chickamauga Cr., Catoosa County
Logperch, Conasauga (*Percina jenkinsi*) - E,CH	Conasauga R., Murray County
Sturgeon, shortnose (*Acipenser brevirostrum*) - E	Coastal rivers

Plants

Florida torreya (*Torreya taxifolia*) - E	Decatur County
Green pitcher plant (*Sarracenia oreophila*) - E	Towns County
Hairy rattleweed (*Baptisia arachnifera*) - E	Wayne, Brantley Counties
Persistent trillium (*Trillium persistens*) - E	Tallulah-Tugaloo River system, Rabun and Habersham Counties

WATER, GAS & LIGHT COMMISSION
ALBANY, GEORGIA

SOUTHEASTERN SECTION
AMERICAN WATER WORKS ASSOCIATION
ANNUAL CONFERENCE
APRIL 29 - MAY 2, 1984
JEKYLL ISLAND, GEORGIA

City of Albany
Dougherty County

MAY 1, 1984

GROUNDWATER USE AND PERMITTING

W. M. STEEVES

BCM CONVERSE INC.
ENGINEERS
MOBILE AND MONTGOMERY, ALABAMA
PANAMA CITY, FLORIDA
ALBANY, GEORGIA
AND
BILOXI, MISSISSIPPI

BCM

BCM Converse Inc.
Engineers, Planners and Scientists

GROUNDWATER USE AND PERMITTING

W. M. Steeves, Vice President, BCM Converse, Inc.
P. O. Box 114, Albany, Georgia 31702 (912) 432-7191

In a 1982 application to the Georgia Department of Natural Resources to operate an expanded water supply system, the Albany Water, Gas & Light Commission requested an increase in peak day flow from 27.2 MG to 29.2 MG. The request has been granted, but only after several appeals by the Commission and meetings with the Department. The negotiated permit conditions are unique in Georgia, and have required a change in the basis of the Commission's water system operations. Since the same conditions may be considered in other permitting actions by DNR, we were asked to review our experience here.

The Albany Water, Gas & Light Commission operates the public water supply system for the Albany metropolitan area within Dougherty County. We have over 28,000 customers, and pump about 17 million gallons on an average day, from a total of 29 deep wells. Water quality is excellent and treatment is limited to chlorination and fluoridation. The well pumps serve as distribution pumps.

Commercial and industrial use account for approximately half of the water sold. On typical dry and wet weather days, hourly system pumpage generally follow the patterns shown in Exhibit 1. Elevated storage buffers actual use and allows flexibility in an operation control system based on response to system pressure.

Well location has historically been dispersed with population and use; however, in the last 10 years, location and well design have been selected with growing consideration for the impact of groundwater withdrawal. Exhibit 2 shows current well locations on an area map. The wells are numbered chronologically and thus reflect general well placement patterns.

All of the wells can be considered multi-aquifer wells in that they penetrate, and are hydraulically connected to, at least 2 of 4 separately identifiable aquifers generally underlying the area. In most cases, the wells interconnect 3 of the aquifers.

Information about area geology, groundwater hydrology, and some area water use is published in reports by the Albany Water, Gas & Light Commission, the U. S. Geological Survey, and the Georgia Geologic Survey. For our purposes. Exhibit 3 shows a geologic cross-section of aquifer formations. The uppermost is the Ocala limestone, next the Tallahatta sand, the Clayton limestone, and lowermost, the Providence, consisting primarily of sand and coquina deposits. Productivity, depth, and screening requirements have determined aquifer selection and well design, except that the Ocala aquifer has been avoided as a precaution against surface contamination that could occur in the porous formation. Exhibit 4 shows typical sections of wells that draw water from the Tallahatta, Clayton, and Providence aquifers. The approximate 1983 water pumpage by the Commission from the aquifers is shown in Exhibit 5.

EXHIBIT 5

AQUIFER	MG PUMPED	% OF TOTAL
Ocala	0	0
Tallahatta	3716	61
Clayton	1972	33
Providence	387	6
TOTALS	6067	100

Most of the pumpage has come from the Tallahatta and Clayton formations. The Providence represents only a small fraction of the total because it is a relatively tight formation that doesn't give up much water, and the cost to screen it has not always been considered worth the result.

With that background, let's move closer to the groundwater issue that has focused attention on our system. As in any groundwater supply system, static and pumping water levels must be considered key factors in planning and use of the resource. Consideration becomes critical when there are long term water level declines that cannot be accommodated, or when the rate of decline changes. The latter situation started in the Albany area six years ago. Long term static water levels in each of our groundwater formations have been well documented. Exhibit 6 illustrates static water level decline in 5 of the oldest wells in the Commission's system. Before 1973, combined static water level of the three aquifers dropped at a rate between 1 and 2 feet per year. The rate from 1973 to 1980 averaged 6 feet per year.

Prompted by the changing groundwater conditions in the mid 70's, the Commission sponsored a study with the USGS to define the impact of groundwater use at that time and provide information that would help assess long range use of the resource.

The resulting report identified increasing municipal and agricultural water use, confirmed a supply of good quality water, suggested increased use of the Tallahatta aquifer in the southeast part of the area, supported increased well spacing, and recommended further study to define development potential of the Ocala aquifer. The report cautioned that heavy agricultural use of the Clayton in the area could limit the availability of water from this aquifer.

An illustration of how accurate that advice was is shown in Exhibit 7. Between 1978 and 1981 the Clayton water level *fell 10 feet per year. This exceeded the* decline in other aquifers. Even though the Providence level fell seven feet per year in the same time period, the Clayton had our attention because it provided a third of the use. Also, in our area the Providence is a source of recharge for the Clayton and is expected to have somewhat parallel potentiometric conditions.

A better picture of the change in Clayton water level is illustrated in Exhibit 8, where monthly levels are shown for the past 12 years. Available earlier data supports a conclusion that the 60 foot water level drop in the Clayton aquifer between 1976 and 1981 exceeds previous rates of decline.

One reason for the change in the pattern of the Clayton water level is Albany's location near the end of the water-bearing part of that formation. Clayton transmissivity and yield increase in a northwest direction. For instance, most of the Commission's wells produce 200 to 400 GPM from the Clayton, whereas 15 to 20 miles northwest, a well in the Clayton can be expected to yield close to 2,000 GPM. Also, limestone in the Clayton formation allows open hole wells, making them fairly inexpensive. It is not surprising that agricultural interests in the area have used the Clayton for supplying water to the central pivot irrigation systems that became so popular in southwest Georgia in the 70's. The number of irrigation systems our county, and those north and northwest of us (upstream in the Clayton aquifer) increased 138%, 178%, and more than 200% respectively between 1977 and 1980. USGS and Georgia Geologic Survey reports show that agricultural water use in the counties north and west of Albany accounted for over 40 billion gallons of water in 1980.

Exhibit 9 compares Clayton water levels from Exhibit 8 with the Commission's Clayton water use, and with growing season rainfall. We've concluded that low rainfall during our warmest months will result in increased Clayton water use to the extent that water level decline in the Clayton aquifer could be evidenced within months. This is not to say that municipal, agricultural, or industrial interests alone cause the decline. Rather, that we're all drawing from the same supply, and that the 1977 - 1981 combined withdrawals may have tested the supply limits of the aquifer.

This thought is supported in a recent Georgia Geologic Survey report addressing the hydrology of the Clayton and Claiborne (Tallahatta) formations in southwest Georgia. The report determined that "it is probable that withdrawals from the Clayton aquifer exceed recharge". The conclusion was based on an estimated Clayton aquifer withdrawal averaging 26 MGD, and estimated recharge averaging 16 MGD.

It was in this light that Georgia DNR denied the Commission's request to increase maximum day withdrawals from 27.2 MG to 29.2 MG. Discussions showed that the denial was intended as a step to reduce water use from the Clayton aquifer. The Commission was just as interested in safeguarding the Clayton, but objected to the denial for two reasons. First, limiting maximum day use is not an effective measure to reduce aquifer withdrawal volume. Of the approximate 6,000,000,000 gallons a year pumped, the two or three days a year that use might exceed, 27,000,000 gallons (say 2,000,000 gallons a day more for 3 days) would represent only one tenth of one percent of the total use. Second, methods for limiting high daily water use are not positive.

The agreement reached, aimed permit limitations more directly at Clayton aquifer use. Special conditions of the permit limit yearly average withdrawal to 20 million gallons a day, and total yearly withdrawal from the Clayton aquifer to 2 billion gallons.

Two wells we've constructed since 1980 use less than 10 percent Clayton water. Whether this, and reduced use of wells with heaviest Clayton percentages, will allow us to comply with the 2 billion gallon annual limit remains to be seen. We expect that it will. More important though, we've seen that the Clayton aquifer in the area is susceptible to withdrawals other than our own, and that given certain weather conditions, it may not be a dependable water source, regardless of the Commission's actions. In 1980 the Commission sponsored a three year study of the Ocala aquifer in the area as one possible alternative to reduced Clayton reliability. Early drafts of this report indicate that parts of the Ocala can safely be used to accommodate increased system pumpage. This is one alternative identified thus far that reduces our dependence on a groundwater source that has shown stress during extended dry periods.

In summary, the Commission's experience shows that it is important to know how your groundwater system works. Although groundwater withdrawal in the southeast is likely to be less than 10% of available groundwater sources, distribution of sources and use are not coincidental. Total 1980 groundwater use in the southeast has been estimated to be 7.5 billion gallons per day, and to increase to 18 billion gallons per day by 2020. Continuing to learn about the hydrology of your water resource will help you safely get the most from it. It will also indicate factors beyond the control of the water utility that can influence the resource. If you have an idea of what can happen, you can be better prepared to deal with it.

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MINIMUM AND MAXIMUM DAY PUMPAGE
1983

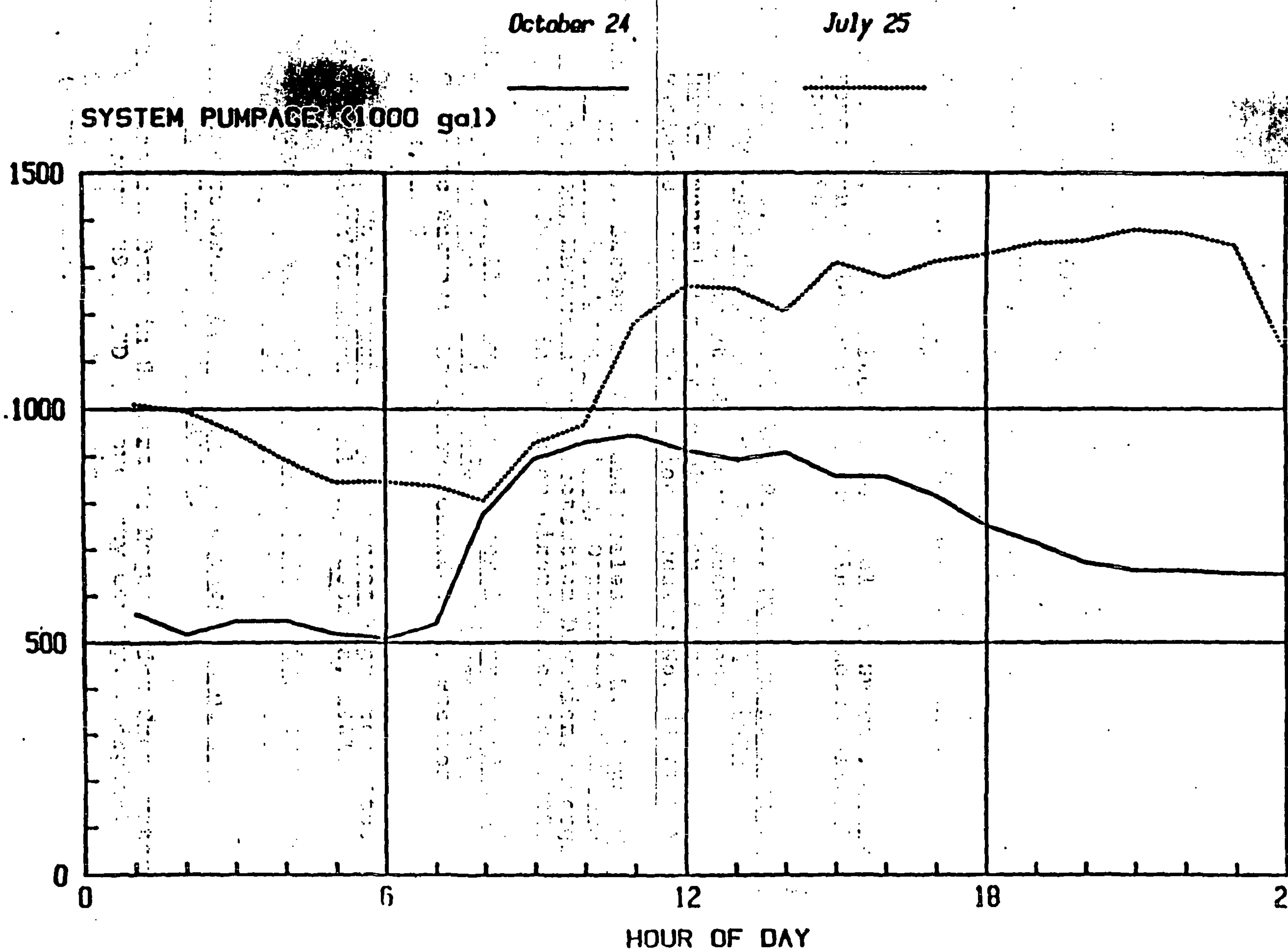
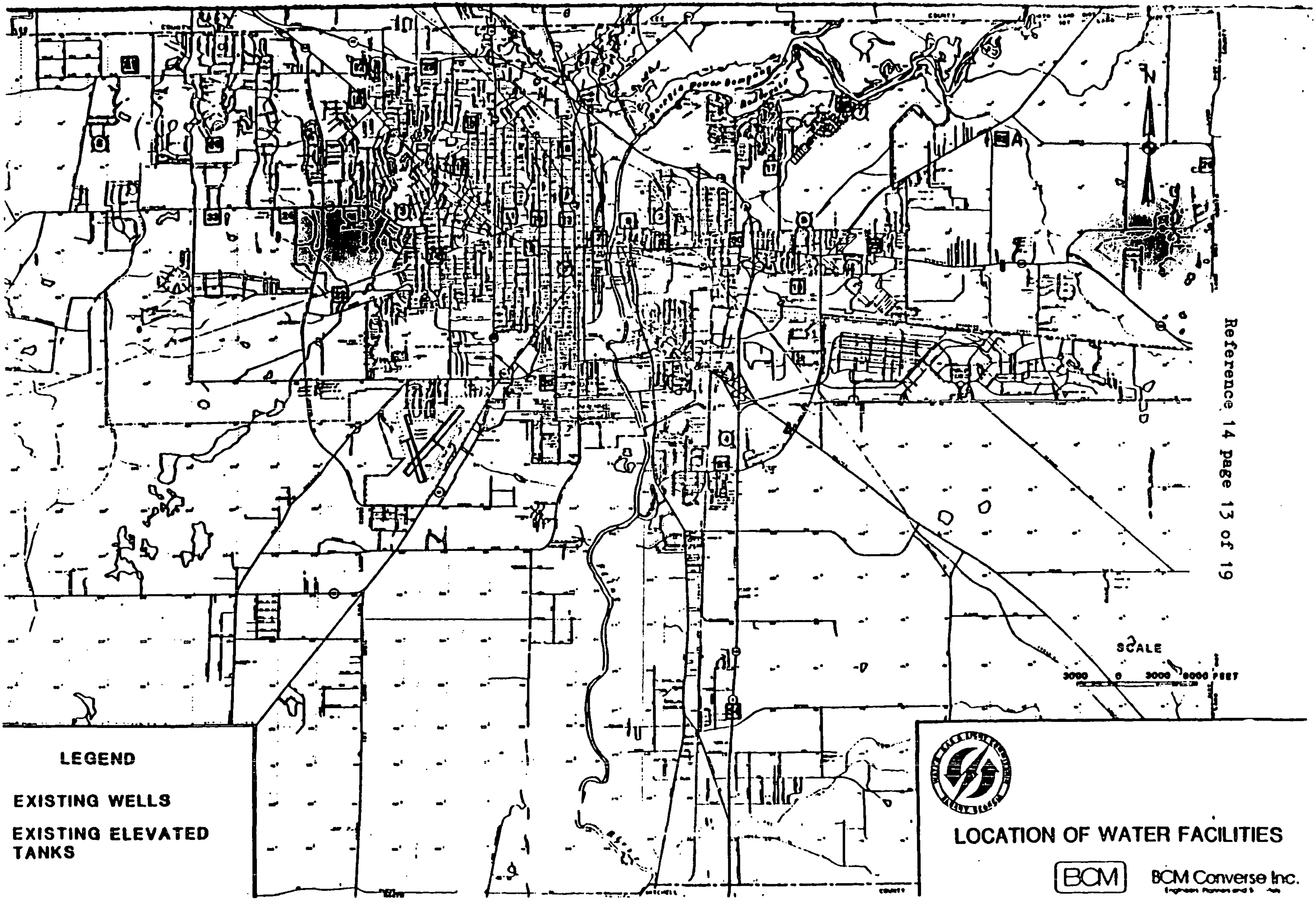


EXHIBIT 1

Reference 14 page 12 of 19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SCALE
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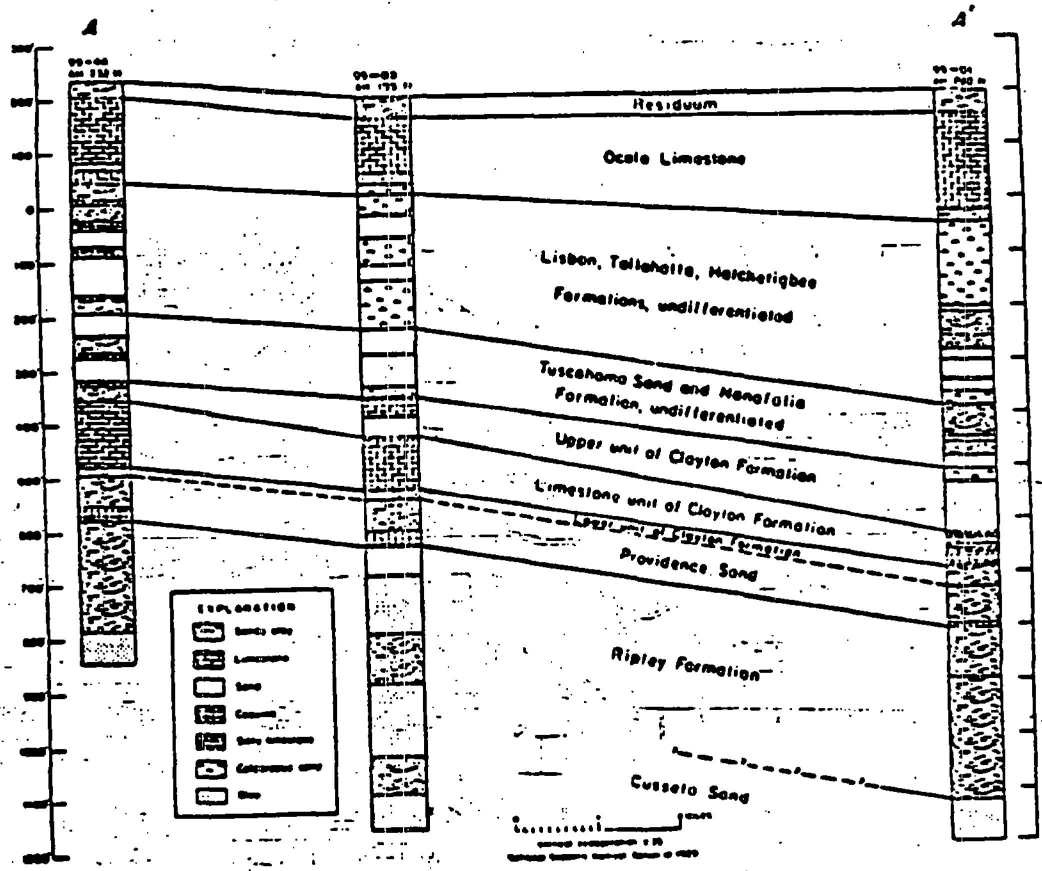
Reference 14 page 13 of 19
LEGEND
EXISTING WELLS
EXISTING ELEVATED TANKS
LOCATION OF WATER FACILITIES
BCM
BCM Converse Inc.

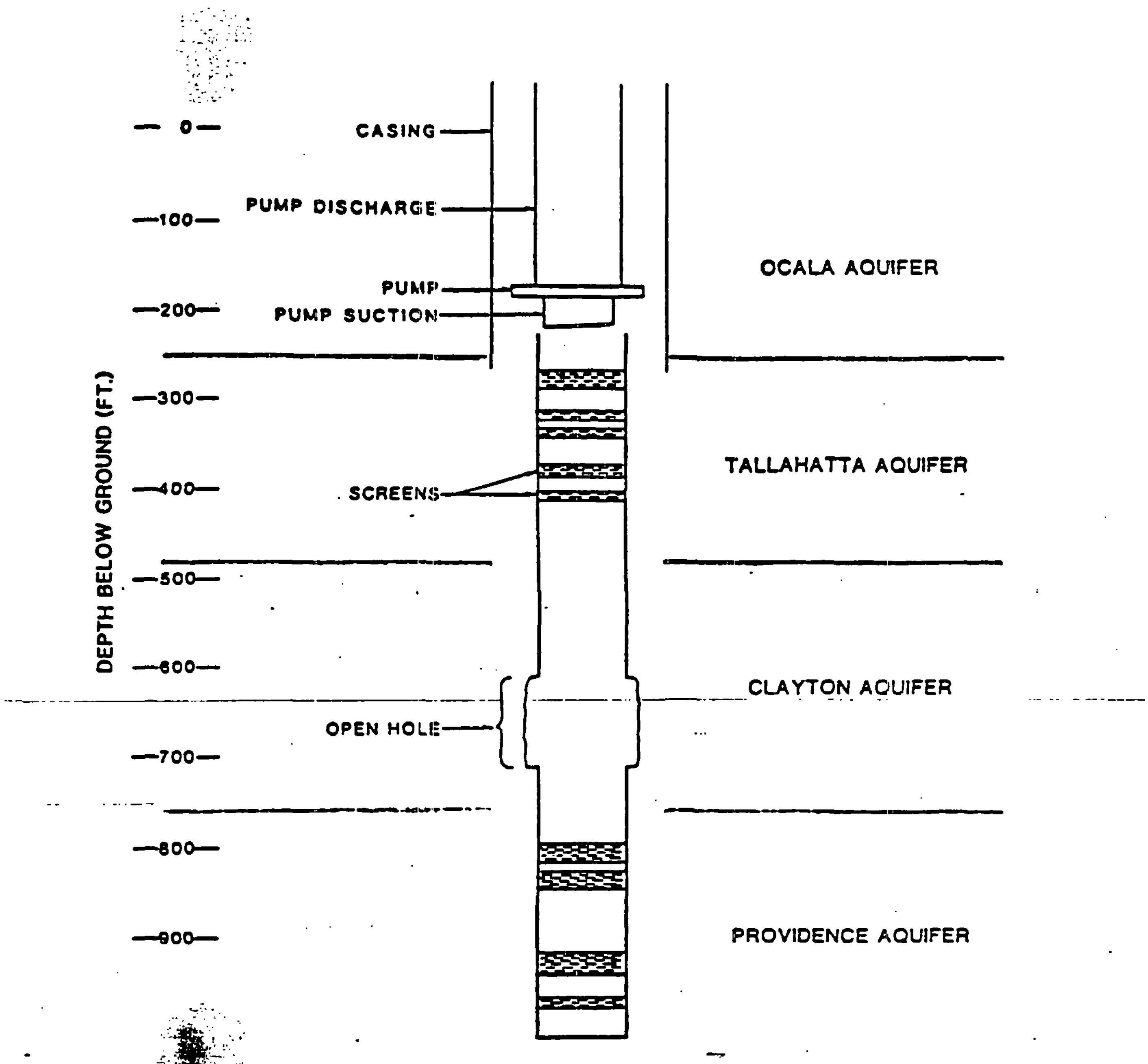
EXHIBIT 2



GEOLOGIC SECTION OF THE ALBANY AREA

SOURCE: U. S. G. S. INFORMATION CIRCULAR NO. 57

EXHIBIT 3



TYPICAL WELL PROFILE

EXHIBIT 4

STATIC WATER LEVELS

WELLS 6, 8, 9, 12 & 13

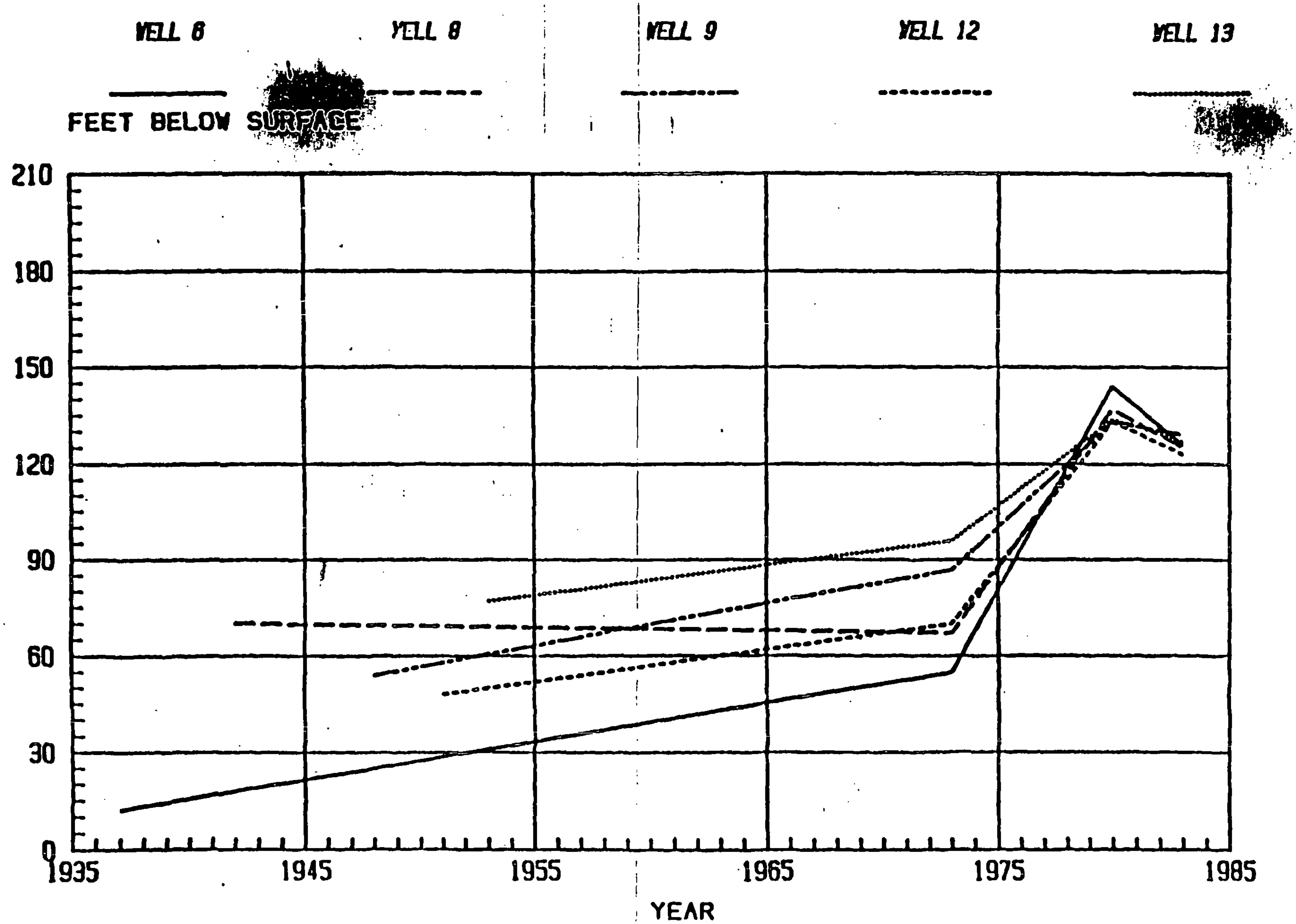
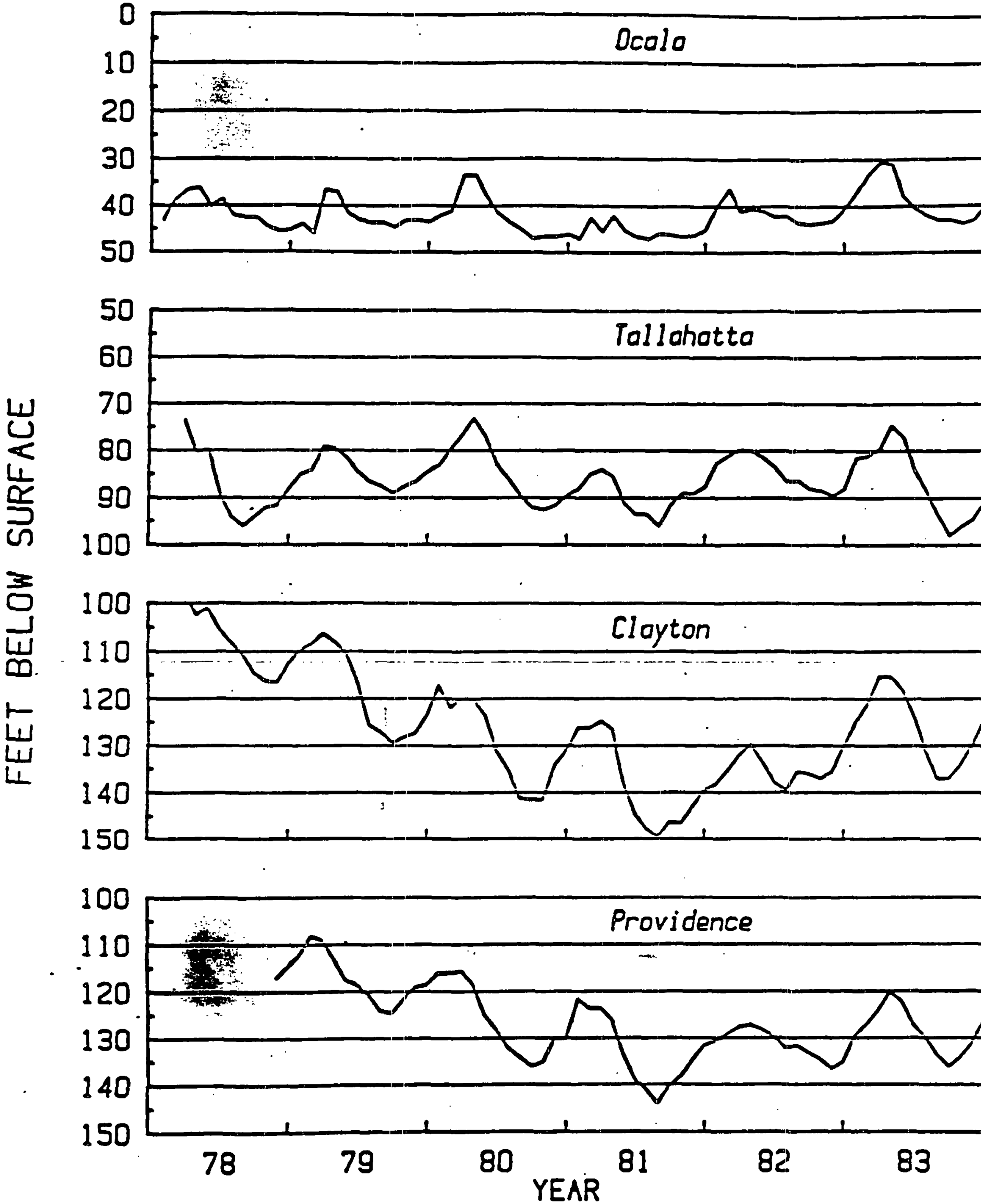


EXHIBIT 6

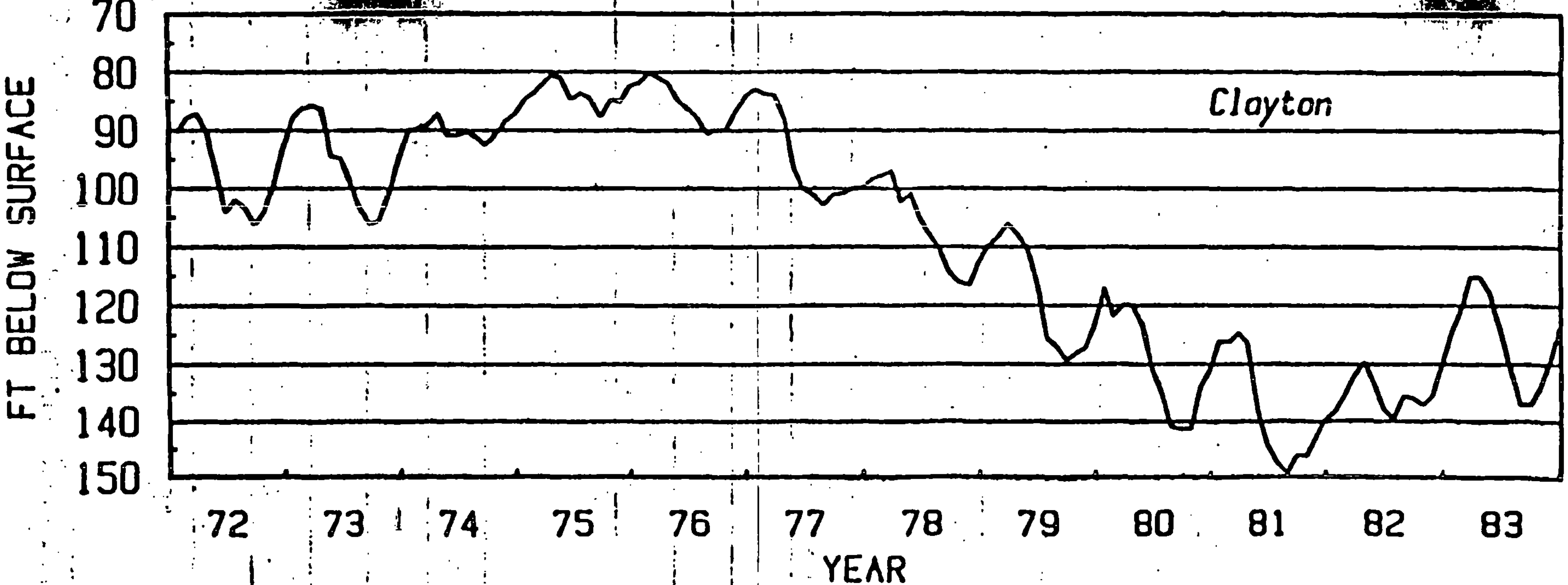
Reference 14 page 16 of 19



COMPARISON OF AQUIFER WATER LEVEL CHANGE

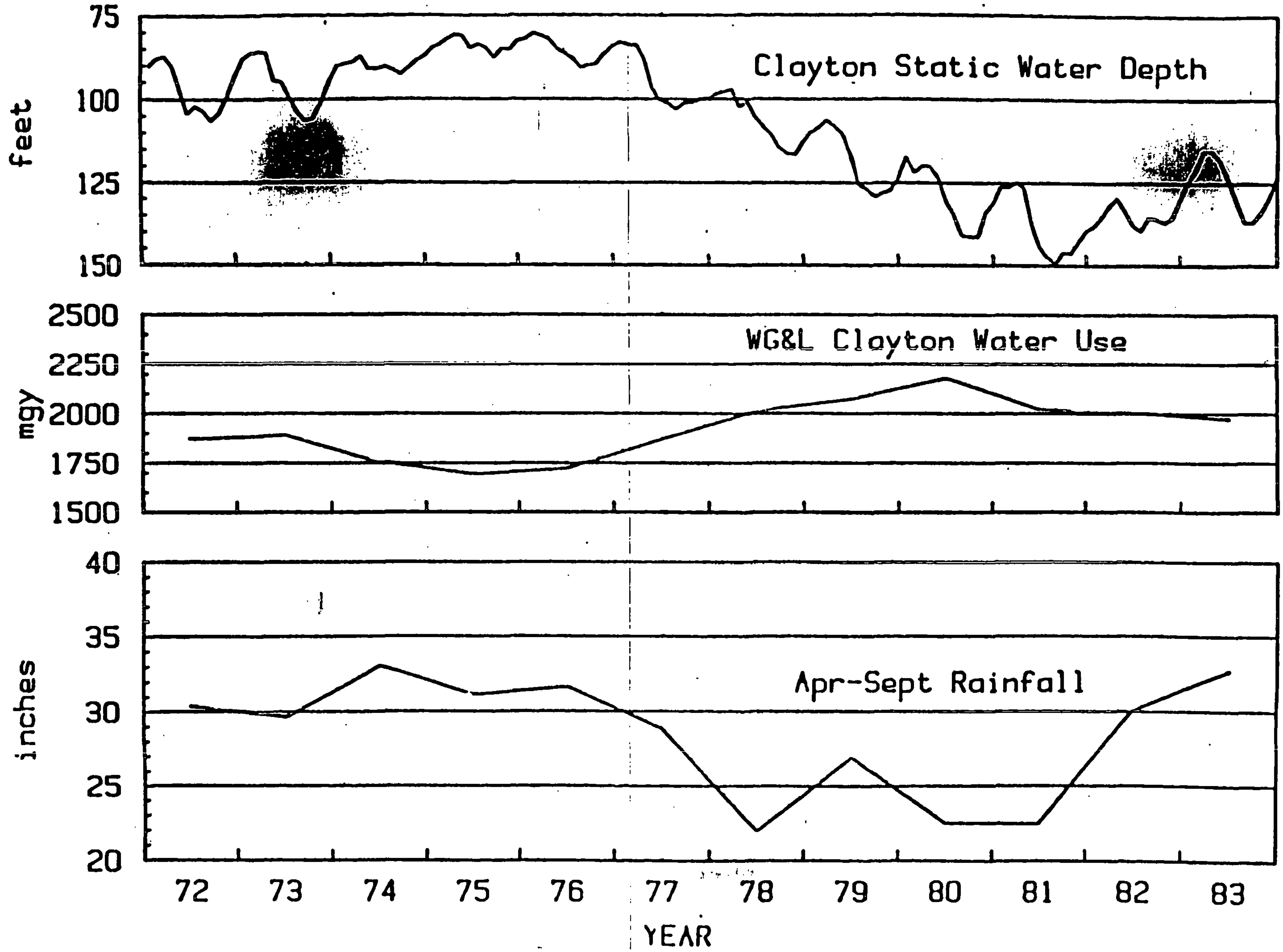
EXHIBIT 7

EXHIBIT 8



RECORD OF AQUIFER STATIC WATER LEVEL

EXHIBIT 9



Reference 14 page 19 of 19

Reference 15

Georgia Department of Natural Resources
205 Butler Street, S.E., Floyd Towers East, Atlanta, Georgia 30334
J. Leonard Ledbetter, Commissioner
Harold F. Reheis, Assistant Director
Environmental Protection Division
(404) 656-4713

September 3, 1986

MEMORANDUM

TO: Mike Allred *Mike Allred*
Unit Coordinator
Site Assessment Unit

FROM: Charles P. Evans *CPE*
Environmental Specialist
Site Assessment Unit

SUBJ: Accessibility of surrounding population to waste on Firestone Tire and Rubber Company facility, Albany, Georgia 31705 (GAD990855074).

The Firestone Tire and Rubber Company, Albany, Georgia has twenty-four hour security guards that control access to the plant. As the contamination is in the groundwater and not on the surface, exposure of the surrounding population to contamination is low.

CPE/mcw037
File - Firestone Tire and Rubber (GAD990855074)